Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

Certification Course

on

Acoustical Physics of Music

(CCAS 01)

Offered by

School of Basic and Applied Sciences

Shobhit Institute of Engineering and Technology

(Deemed to be University)

Registrar
Shobhit Institute of Engg. & Tech.
(Deemed to-Be University)
NH-58, Modipuram, Meerut-250110

SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

Acoustical Physics of Music

Prerequisites: None

Course Objective: To provide a fundamental physical understanding of the nature of sound, hearing, and music.

Course Duration: 40 Hrs.

Course Description:
We will begin to explore increasingly intricate aspects of how simple waves are combine in extremely precise ways to create the complex sounds we experience in everyday life, with a focus on how our perception of these sounds works, how the phenomenon of music arises, how certain instruments create their own unique versions of it, and how music is recorded and/or presented to an audience. We understand that most of you are not majors in science or engineering, so some of the technical concepts will be new to you.

Unit 1. Oscillations, Waves and Sound

Simple harmonic oscillations. Amplitude, period, and frequency (pitch). Harmonic oscillations with slowly changing parameters. Perception of sound. Combinations of harmonic oscillations. Beats. Phase relations and psychoacoustical Ohm's law, phase beats. Damped and driven oscillations, resonance. Periodic waves, solitary waves, wave packets. Wave length, sound velocity. Spherical and cylindrical waves. Longitudinal and transverse waves. Surface acoustic waves. Reflection and refraction of waves. Refraction of sound in the atmosphere. Doppler effect. Sonic booms and shock waves.

Unit 2. Standing Waves and Overtone Series

Standing waves in general. Role of boundary conditions in the formation of standing waves. Node-node, antinode-antinode, and node-antinode boundary conditions. Overtone's series. Mersenne's laws. Analysis and Synthesis of Complex Waves: Synthesis of complex waves. Fourier analysis and Fourier spectra. Analysis of tone quality: Attacks and decays, formants. Vibrato and tremolo. Discrete and continuous Fourier spectra. Spectrograms: Narrow-band and wide-band.

Unit 3. Hearing, Speech and singing

Transmission of the signal through the ear parts. Place theory of hearing: Frequency response and frequency resolution. amplitude and the intensity of the sound. neurophysiology of the hearing process. Sensitivity of the ear to the sound intensity. The decibel scale of sound

intensity level. Nonlinearity of the ear. Aural harmonics. Combinational tones. Fundamental tracking. Cochlear implants as a confirmation of the place theory of hearing. Structure of speech and singing apparatus. Throat and mouth as a resonator. Naive open-closed-pipe theory of the throat-mouth resonator. Resonances as formants in shaping the output sound. Production of the glottal wave by the vocal folds, Bernoulli law. Difference between singing, speech, and hoarse speech. Simplified two-formant synthesis of vowels.

Unit 4. Room and auditorium acoustics

Direct and reflected sound. Texture of the echo. Definition of the reverberation time. Fullness and clarity. Warmth and brilliance. Formula for the reverberation time. Absorption and reflection coefficients. Resonances in room of a box. shape. General principles of constructing concert halls. architectural acoustics and the science of reverberation, Sabine equation. Basic parameters, design and modification of spaces using different types of absorbers and treatments. Active methods of noise reduction and room treatment (e.g., phantom acoustic shadows). Diffusion through reflection-phase gratings (quadratic-residue and primitive-root diffusers). Helmholtz resonators. Room dimensions.

Unit 5. Equipment used for recording music

Microphones and preamplifiers, analog (tape and records) and digital formats for recording. **Home playback and reproduction of music** – general categorization of mass-Fi, mid-Fi and HiFi qualities and philosophies. Sources (tape, record, CD, DVD-audio, SACD, etc.), preamplifiers (tubes and solid-state, chips vs discrete), amplifiers, speakers (dynamic, electrostatic, planar magnetic, etc.). Room choice and placement of components. Wiring and interfacing (concept of impedance mismatch and mechanical and dielectric degradation). **Working of some acoustical and electronic musical instruments** – electric guitar and its effects, etc.

Learning outcomes: At the end of this course students will be able to

1. Understand how a harmonic oscillator works and the concepts of resonance and formants.
2. Understand the concepts and interrelationships between wavelength, frequency, and speed of a wave.
3. Understand the origin of harmonics in string and wind instruments.
4. Understand the concepts of loudness, intensity levels and decibels.
5. Understand some basics of the neurophysiology of the hearing process and the causes of hearing loss.
6. Understand tones and the basic of musical scales.

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Shobhit
Institute of Engineering & Technology
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EDUCATION EMPOWERS

Certification Course

on

Automotive Technology Level 1

(CCME 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

Registrar
Shobhit Institute of Engg. & Tech.
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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
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Course Descriptions and Outlines

Automotive Technology

Level 1

Course Description

Duration: 60 Hrs.

Term: 3 Hours per day

Prerequisite: none

Description: This is the study of an automobile. There will be a hands-on experience class involving activities that relate directly to maintenance, repair and service. The program of instruction may include: safety in the shop, care and use of tools, interpretation of parts books, parts handling, engine construction, ignition systems, fuel systems, charging systems, starting systems, electronic systems, chassis wiring and diagrams, brakes, lubrications and minor tune-up. Students may be involved in BMW Skill Next Program.

Course Outline

Orientation	Introduce Develop Master
A. Occupational outlook	I
B. Places that employ auto mechanics	I
C. Student requirements for the auto mechanics program	I/D
D. Steps involved in automotive shop work	I/D
E. Skills USA	I
F. Ways Skills USA state and national dues are used	I
G. Mandan automotive program rules	I/D
H. MSDA	I/D
I. Personal information sheet	I/D/M
J. Follow instructions sheet	I/D/M
K. Job application form	I/D/M

Safety	
I. Safety	
A. Terms related to the unit	I/D/M
B. Colors and application of the safety color code	I/D/M
C. Personal safety rules	I/D/M
D. General shop safety rules	I/D/M
E. Safety rules involving hand tools	I/D/M
F. Safety rules involving the engine	I/D/M
G. Battery safety	I/D/M
H. Safety rules involving flammable liquids	I/D/M
I. Equipment safety rules	I/D/M
J. Components of the fire triangle	I/D/M
K. Classes of fire	I/D/M
L. Types of fire extinguishers	I/D/M
II. Machine Safety Rules	
A. Parts washer	I/D/M
B. Engine hoist	I/D/M
C. Grinder	I/D/M
D. Hydraulic press	I/D/M
E. Drill press	I/D/M
F. Hoist	I/D/M
G. Floor jack	I/D/M
H. Pressure washer	I/D/M
III. Automotive lift	
A. Safety tips	I/D/M
B. Safety pledge form	I/D/M
IV. Safety Review	
A. Individual Student Shop Safety Inspection Form	I/D/M
Hand Tools	
A. Purpose of hand tools & storage	I/D/M
B. Types of screwdrivers	I/D/M
C. Types of pliers	I/D/M
D. Types of wrenches	I/D/M
E. Components of a socket set	I/D/M

F. Types of sockets	I/D/M
G. Special purpose sockets	I/D/M
H. Types of hammers used in the auto shop	I/D/M
I. Types of punches	I/D/M
J. Types of chisels	I/D/M
K. Types of files	I/D/M
L. Types of file teeth	I/D/M
M. Types of parts cleaning tools	I/D/M
N. General shop tools	I/D/M
O. Battery service tools	I/D/M
P. Starter service tools	I/D/M
Q. Charging system service tools	I/D/M
R. Ignition service tools	I/D/M
S. Fuel system service tools	I/D/M
T. Exhaust system service tools	I/D/M
U. Cooling system service tools	I/D/M
V. Lubrication service tools	I/D/M
W. Brake service tools	I/D/M
X. Front-end service tools	I/D/M
Y. Engine repair tools	I/D/M
Z. Drive line service tools	I/D/M
AA. General Torque Specification Chart	I
Rules and Measures	
I. Rules	
A. Terms related to the unit	I
B. Basic units of measurement	I/D
C. Fractional units found on rules	I/D
D. Decimal units found on rules	I/D
E. Metric units found on rules	I/D
F. Rules used in shop work	I
G. Uses of the rule with accessories	I
H. Procedure for using rules	I/D
I. Steps for reading the rules	I/D
II. Outside micrometer	
A. Types of measurements found on the outside micrometer	I/D/M
B. Major parts of the outside micrometer	I
C. Steps in selecting the proper size outside micrometer	I/D/M

D. General rules for use and care of micrometers	I/D
E. Definition of "feel" when using a micrometer	I/D
F. Methods of checking accuracy of outside micrometers	I/D/M
G. Reading the plane micrometer	I/D/M
H. Reading the vernier micrometer	I/D/M
Service Manuals	
A. Car information section	I/D/M
B. General service information section	I/D/M
C. Carline unit index	I/D/M
D. Specification sheets	I/D/M
E. Repair information section	I/D/M
F. Labor and parts guide	I/D/M
G. Repair order	I/D/M
Electrical Unit	
I. Basic electrical theory	
A. Terms related to basic electricity	I
B. Parts of the atom and their values	I
C. Electricity according to the electron theory	I
D. Basic factors of electrical flow in a circuit	I
E. Relationship of voltage, amperage, and ohms to current flow	I/D
F. Ohms Law	I/D/M
G. Calculating problems using Ohms Law	I/D/M
H. Factors effecting resistance in a conductor	I/D
I. Basic electrical symbols	I/D/M
J. Components of a basic electrical circuit	I/D/M
K. Types of electrical circuits	I/D/M
L. Instruments for testing electrical circuits	I/D/M
M. Methods of connecting test instruments	I/D/M
N. Basic electrical circuit failures	I/D
O. Characteristics of magnetism	I/D
P. Characteristics of electromagnetism	I/D
Q. Electromagnetic induction	I/D
R. Factors determining magnitude of induce voltage	I/D

II. Battery service	
A. Terms related to the battery	I
B. Functions of a battery	I/D
C. Purposes of the battery parts	I/D
D. Converting chemical energy into electrical energy	I/D
E. Factors affecting battery voltage and capacity	I/D
F. Battery capacity in amperes	I/D
G. Types of battery rating	I/D
H. Safety rules	I/D/M
I. Features of a service-free battery	I
J. Jump starting a vehicle	I/D
III. Charging system	
A. Purpose of the charging system	I/D
B. Terms related to the charging system	I
C. Charging system components	I
D. Parts of the generator	I
E. Parts of the alternator	I/D/M
F. Differences between an alternator and generator	I/D
G. Advantages of a alternator over a generator	I/D
H. Reason an alternator produces more current at low speed than a generator	I/D
I. Stator construction	I/D
J. Types of stator windings	I/D
K. Current and voltage regulation in an alternator	I/D
L. Types of voltage regulators for alternators	I/D
M. Troubleshooting the charging system	I/D/M
IV. Starting system	
A. Terms related to the starting system	I/D
B. Purpose of the starting system	I/D
C. Operating principle of the starter	I
D. Magnetic principles of the starter	I
E. Path of current flow in a series wound starter	I
F. Components of the starting system	I/D
G. Types of starter switches	I/D
H. Parts of the starter	I/D/M
I. Major parts of the gear reduction starter	I/D/M
J. Types of starter drives	I/D
K. Components of a starter control circuit	I/D
L. Starting system control circuit components and their functions	I/D
M. Troubleshooting the starting system	I/D/M

V. Ignition system	
A. Terms related to the ignition system	I/D
B. Purpose of the ignition system	I/D
C. Components of the ignition system	I/D
D. Function of the ignition system components	I/D
E. Distributor components	I/D/M
F. Components of the ignition system circuits	I/D
G. Operation of the ignition system	I/D
H. Parts of the spark plug	I
I. Spark plug heat ranges	I
J. Spark plug conditions and their causes	I/D/M
K. Types of secondary ignition cables	I/D
L. Transistorized and capacitive discharge ignition system	I
M. Relationship of the electronic ignition system to the conventional ignition system	I/D
N. Advantages of the electronic ignition system	I/D
O. Major components of the electronic ignition system	I/D/M
P. Function of the components of the electronic ignition system	I/D
Q. Operation of the electronic ignitions system	I/D
VI. Chassis wiring	
A. Terms related to chassis wiring	I
B. Electrical symbols	I/D
C. Types of electrical terminals and connectors	I/D
D. Types of bulbs used in automobiles	I
E. Parts of the sealed beam	I
F. Differences between hot and ground circuits	I/D
G. Facts about voltage drop	I/D/M
H. Facts about current draw	I/D/M
I. Single and two-wire circuits	I/D
J. Instruments used in testing automobile electrical circuits	I/D/M
K. Steps in diagnosis of an electrical problem	I/D/M
L. Characteristics of a wiring diagram	I/D/M
M. Parts of a typical circuit identification code	I/D/M
Brake Unit	
I. Wheel bearings	
A. Terms related to unit	I/D
B. Types of front wheel bearings	I/D/M
C. Parts of a tapered roller front wheel bearing assembly	I/D/M

D. Characteristics of quality wheel bearing grease	I
E. Precautions to observe while packing wheel bearings	I/D/M
II. Brake systems	
A. Purpose of the brake system	I/D
B. Terms related to unit	I/D
C. Components of the standard brake system	I/D/M
D. Components of the tandem or dual brake system	I/D/M
E. Parts of a standard master cylinder	I/D/M
F. Parts of a tandem master cylinder	I/D/M
G. Parts of a wheel cylinder	I/D/M
H. Parts of a standard brake assembly	I/D/M
I. Types of self-adjusting brake systems	I/D
J. Brake operation	I/D/M
III. Power disc brakes	
A. Terms related to unit	I/D
B. Major components of the disc brake system	I/D
C. Disc brake components and their functions	I/D
D. Types of disc brake calipers	I
E. Parts of a floating caliper disc brake	I/D/M
F. Characteristics of disc brakes	I
G. Reasons disc brakes may require power booster units	I/D
H. Sources of energy used for power boosters	I
I. Types of vacuum operated power boosters	I/D
J. Major parts of a vacuum operated power booster	I
K. Major parts of a hydro-boost power booster	I
L. Operation of the vacuum suspended power booster	I/D/M
M. Operation of the atmospheric suspended power booster	I/D/M
N. Operation of the hydro-boost power booster	I/D/M
O. Requirements of super heavy-duty brake fluid	I
P. Conditions that are considered normal and are not indications that the master cylinder needs service	I/D/M
Q. Parts of a parking brake system on four wheel disc brakes	I
IV. Anti-lock brake system	
A. Safety precautions	I/D/M
B. Lug nut torque specifications	I/D/M
C. Description	I
D. Operation	I
E. Diagnosis and testing	I/D
F. Note on intermittents	I

G. Depressurizing the system	I/D
H. Component removal and installation	I
J. Wheel sensor air gap	I
K. Bleeding brake system	I/D/M
L. Reading wiring diagrams	I/D
M. Pin-out checks	I

Shobhit
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EDUCATION EMPOWERS

Certification Course

on

Automotive Technology Level 2

(CCME 02)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

Registrar
Shobhit Institute of Engg. & Tech.
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Automotive Technology

Level 2

Course Description

Duration: 60 Hrs.

Term: 3 Hours per day

Prerequisite: Automotive Technology Level 1

Description: This is a continuation of the Automotive Technology Level 1 course with more advanced training and more skill required in the use of tools and equipment. This course is designed to give the students the opportunity to learn practical application along with the related material in the following areas: engine rebuilding, transmissions, clutch, drive train, differentials, major tune-up, and electronic emission control systems. The students may be involved in the BMW Skill Next Program.

Course Outline

Engine Repair	Introduce Develop Master
I. Basic Engine Principles	
A. Terms related to the unit	I
B. Characteristics of energy	I
C. Types of energy	I
D. Forms of available energy	I
E. Types of motion	I
F. Simple machines	I
G. Uses of simple machines	I
H. Calculating work	I/D
I. Calculating horsepower	I/D
J. Formula for torque	I/D
K. Characteristic of heat engines	I
L. Types of heat engines	I
M. Parts of basic internal combustion engine	I/D

N. Process for converting chemical energy into rotary motion	I
O. Operation of four-stroke cycle engine	I/D/M
P. Valve timing and overlap	I/D
Q. Operation of two-stroke cycle engine	I/D
R. Formula for cubic inch displacement	I/D
S. Results of increasing compression ratio	I/D
T. Components of an automobile engine	I/D
U. Gasoline and diesel engines	I
V. Purpose of a heavy flywheel	I
II. Engine Condition Evaluation	
A. Terms related to unit	I
B. Conditions causing low oil pressure	I/D
C. Conditions that cause oil consumption	I/D
D. Items to inspect for engine condition evaluation	I/D/M
E. Items to check prior to testing for internal engine noise	I/D/M
F. Internal engine noise diagnosis	I/D/M
III. Engine Removal	
A. Terms related to unit	I
B. Safety precautions to observe while removing an engine	I/D/M
IV. Engine Disassembly	
A. Terms related to unit	I/D
B. Safety precautions to observe during engine disassembly	I/D/M
C. Factors to consider when preparing to disassemble an engine	I/D
D. Items to inspect during engine assembly	I/D/M
V. Valve Train and Cylinder Head Reconditioning	
A. Terms related to unit	I/D
B. Purpose of the valve train	I
C. Parts of the valve train	I/D
D. Function of valve train parts	I/D
E. Camshaft locations	I
F. Methods of driving the camshaft	I/D
G. Parts of the camshaft	I/D
H. Parts of the cam lobe	I/D/M
I. Types of valve lifters	I/D/M
J. Parts of a hydraulic valve lifter	I/D/M
K. Operation of a hydraulic valve lifter	I/D
L. Parts of the valve	I/D/M
M. Parts of a valve assembly	I/D/M
N. Types of valve springs and dampering devices	I/D/M

O. Types of valve stem seals	I/D/M
P. Types of valve spring keepers	I/D/M
Q. Purpose of valve spring spacer	I/D
R. Types of valve rotators	I/D
S. Purpose of valve rotator	I/D
T. Reasons a valve must seat properly	I/D/M
U. Causes of valve burning	I/D/M
V. Tools of valve reconditioning	I/D/M
VI. Engine Crankshaft, Bearings and Oil Pump	
A. Terms related to unit	I
B. Purpose of the crankshaft	I/D
C. Parts of the crankshaft	I/D
D. Methods used to manufacture crankshafts	I
E. Types of bearing used on the cam and crankshaft	I/D
F. Construction of an insert bearing	I
G. Bearing spread and crush	I/D
H. Bearing requirements	I/D
I. Causes of bearing failure	I/D/M
J. Action of lubricating oil in an insert bearing	I/D
K. Purpose of torsional vibration damper and flywheel	I
L. Types of rear main bearing oil seals	I/D
M. Types of oil pumps	I/D
N. Parts of an oil pump	I/D
O. Conditions that could lower oil pressure	I/D/M
VII. Cylinder and Piston Reconditioning	
A. Terms related to unit	I
B. Cylinder wear patterns	I/D
C. Methods of reconditioning cylinders	I/D/M
D. Types of cylinder sleeves	I
E. Reasons cylinders wear tapered	I/D
F. Parts of the cylinder block	I/D
G. Types of cylinder block core hole plugs	I/D
H. Parts of a piston and connecting rod assembly	I/D
I. Types of compression rings	I/D
J. Methods of installing compression rings	I/D/M
K. Types of oil rings	I/D
L. Methods of installing oil rings	I/D/M
M. Methods of heat and expansion control in the piston	I
N. Piston conditions and related causes	I/D/M

O. Lubrication of cylinder walls and piston pins	I/D
P. Tools and equipment used in reconditioning cylinders and pistons	I/D/M
Q. Types of piston pin locks	I/D
VIII. Engine Reassembly	
A. Terms related to unit	I
B. Tools used in engine reassembly	I/D/M
C. Reasons for torqueing bolts to specifications in an engine	I/D/M
IX. Engine Installation	
A. Terms related to unit	I
B. Safety precautions to observe during engine installation	I/D/M
C. Factors to consider when installing an engine	I/D/M
D. Items to check or adjust before starting a new or rebuilt engine	I/D/M
E. Break-in procedure	I/D/M
X. Cooling System	
A. Purpose of the cooling system	I/D
B. Terms related to unit	I
C. Types of thermostats	I/D
D. Thermostat operation	I/D/M
E. Job performed by the cooling system	I/D
F. Downflow and crossflow radiators	I
G. Methods of cooling the internal combustion engine	I/D
H. Types of radiator hoses	I/D
I. Pressure cap operation at various temperatures	I/D/M
J. Variable-speed fan drive operations	I/D/M
K. Reasons for using permanent antifreeze solution	I/D
L. Operation of the coolant recovery system	I/D
M. Belt tension	I/D/M
N. Belt inspection	I/D/M
XI. Engine Lubrication System	
A. Terms related to unit	I
B. Purpose of the engine lubrication system	I
C. Components of the engine lubrication system	I/D
D. Purposes of the components of the engine lubrication system	I/D
E. Types of oil filters	I/D
F. Engine oil classifications	I
G. Oil viscosity classifications	I
H. Oil service designation letters and their descriptions	I
I. Points to consider when selecting engine oil	I/D
J. Additives found in engine oil	I

XII. Exhaust System	
A. Purpose of the exhaust system	I
B. Terms related to unit	I
C. Types of mufflers	I
D. Operation of the manifold heat control valve	I
E. Construction and operation of catalytic converter	I
F. Tools for exhaust system service	I
G. Types of exhaust systems	I
H. Prevention of carbon monoxide poisoning	I/D
I. Causes of corrosion of exhaust system	I
J. Basic components of the exhaust gas recirculating system	I
K. Purpose of exhaust gas recirculating system	I
XIII. Fuel System	
A. Purpose of the fuel system	I
B. Terms related to unit	I
C. Components of the fuel system and their purposes	I
D. Fuel pump operation	I
E. Types of fuel filters	I
F. Types of air cleaners	I
G. Parts of the carburetor	I
H. Carburetor systems and their uses	I
I. Gasoline additives and their purposes	I
J. Fuel injection	I
K. Variations of fuel injection systems	I
Manual Drive Train	
I. Clutch Assembly	
A. Terms related to the unit	I
B. Components of the clutch assembly	I/D
C. Parts of a clutch disc	I
D. Types of pressure plates	I/D
E. Clutch operation	I/D
F. Methods used to actuate clutch release	I
G. Mechanisms that allow smooth clutch engagement	I
H. Conditions to look for during clutch inspection	I/D/M
I. Symptoms that may occur when a clutch housing bore has excessive run-out	I
J. Clutch malfunctions and probable causes	I/D/M
K. Problems not requiring clutch removal	I/D/M

L. Clutch problems requiring clutch removal	I/D/M
II. Standard Transmission	
A. Purpose of the transmission	I
B. Terms related to the unit	I
C. Parts of the transmission	I/D/M
D. Parts of a synchronizer	I/D/M
E. Types of gear teeth	I/D/M
F. Three-speed synchromesh transmission operation	I/D/M
G. Gear operation of a three-speed transmission	I/D/M
H. Basic types of overdrives	I
I. Major parts of the electrically operated overdrive	I
J. Operation of the electrically operated overdrive	I
K. Procedure for performance testing shift linkage adjustment	I/D/M
L. Procedure for performance testing the manual transmission	I/D/M
III. Drive Lines	
A. Terms related to the unit	I
B. Types of drive lines	I
C. Components of a propeller shaft	I
D. Types of U-joints	I
E. Parts of a cross and roller or cardan U-joint	I/D/M
F. Parts of a ball and trunnion U-joint	I
H. Parts of a constant velocity U-joint	I/D/M
I. Acceleration-deceleration of propeller shaft equipped with a cross and roller U-joint	I
J. Major components of a four wheel drive	I
K. Tools used in drive line repair	I
L. Methods of controlling drive line vibration	I
IV. Rear Axle	
A. Purpose of the rear axle assembly	I
B. Terms related to the unit	I
C. Parts of a gear tooth	I/D/M
D. Parts of a conventional differential	I/D/M
E. Parts of the planetary differential	I/D/M
F. Types of differential carrier housings	I/D
G. Ring gear and drive pinion tooth contact pattern	I/D/M
H. Gear tooth contact patterns	I/D/M
I. Types of rear axle shafts	I/D
J. Types of rear axle bearings	I/D
V. Automatic Transmission Service	
A. Terms related to the unit	I

B. Repairs which can be performed with the transmission in the vehicle	I
C. Items to include in a automatic transmission tune-up	I
D. Tests that are performed while transmission is in the vehicle	I/D
E. Types of automatic transmission fluids and their applications	I/D/M
F. Procedure for properly checking transmission fluid level	I/D/M
G. Fluid conditions and possible transmission problems	I/D
H. Types of transmission filters	I
VI. Manual Transaxle Operation	
A. Terms related to the unit	I
B. Transaxle components and how they function	I/D/M
C. Transaxle operation	I/D
VII. Manual Transaxle Diagnosis	
A. The operation and design	I/D/M
B. Half shaft diagnosis	I/D/M
VIII. Transaxle Removal and Disassembly	
A. Safety in transaxle removal	I/D/M
B. Procedure for removing the transaxle	I/D
C. Transaxle disassembly	I/D/M
IX. Transaxle Cleaning, Inspection and Assembly	
A. Procedure for cleaning and inspecting transaxle components	I/D/M
B. Clutch inspection	I/D/M
C. Procedure for reassembling and adjusting the transaxle	I/D/M
D. Half shaft repair procedures	I/D/M
X. Transaxle Installation and Performance Testing	
A. Transaxle installation	I/D
B. Procedures for performance testing the transaxle	I/D
XI. Four-Wheel-Drive Components and Operation	
A. Terms related to the unit	I
B. Four-wheel-drive components and functions	I
C. Driveline operation	I
XII. Four-Wheel-Drive Diagnosis and Repair	
A. Safety in four-wheel-drive diagnosis and repair	I/D/M
B. Procedures for diagnosing a four-wheel-drive vehicle	I
C. Repair procedures for locking hubs	I
D. Procedure for removing the front differential assembly	I
E. Repair procedures for front spindals	I
XIII. Transfer Case Components and How They Function	
A. Transfer case components and their functions	I
B. Transfer case operation	I

XIV. Transfer Case Diagnosis and Removal	
A. Transfer case diagnosis	I
B. Safety in transfer case removal	I/D/M
C. Procedures for removing the transfer case	I
XV. Transfer Case Disassembly, Cleaning, Adjustment and Reassembly	
A. Procedure for disassembly of the transfer case	I
B. Procedure for cleaning and inspecting the transfer case	I
C. Transfer case end-play and torque measurements	I
D. Procedure for reassembly of the transfer case	I
XVI. Transfer Case Installation and Performance Testing	
A. Transfer case installation	I
B. Procedure for performance testing and transfer case	I

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EDUCATION EMPOWERS

Certification Course

on

Biomechatronics (CCBM 01)

Offered by

School of Biomedical Engineering

Shobhit Institute of Engineering and Technology

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Bio-Mechatronics

About Bio-Mechatronics:

Bio-Mechatronics is an applied interdisciplinary science that aims to integrate biology and mechatronics (electrical, electronics and mechanical engineering).

It also encompasses the fields of robotics and neuroscience. Biomechatronic devices encompass a wide range of applications from the development of prosthetic limbs to engineering solutions concerning respiration, vision, and the cardiovascular system.

Bio-Mechatronics is the integration of biological components with artificial devices, in which the biological component confers a significant functional capability to the system, and the artificial component provides specific cellular and tissue interfaces that promote the maintenance and functional adaptation of the biological component. Based upon functional performance, muscle is potentially an excellent mechanical actuator, but the larger challenge of developing muscle-actuated, biomechatronic devices poses many scientific and engineering challenges.

Course Duration: 30 Hrs.

Detailed Syllabus

Pre-requisites: Knowledge of Materials and their properties used in Manufacturing process Basic Knowledge of Electrical, Electronics, Mechanics and Biology.

Course Outcomes: At the end of the course, the student will be able to:

CO1	Explain the motivation, ethical issues and future challenges in bio-mechatronics.
CO2	Analyze the design and construction of biomechatronic technologies.
CO3	Evaluate the design and construction of biomechatronic technologies.
CO4	Apply appropriate dynamic models and computational tools to simulate and analyze biomechatronic systems.
CO5	Design simple biomechatronic systems using appropriate hardware instrumentation and end user.

Course Contents

Module 1 Introduction to Bio-mechatronics: clinical examples, highlights of technology, ethical issues and course outline. Nervous and muscular systems: the nervous system as a controller, sensory systems of the body, neurons and action potentials, muscles as actuators.

Module 2 Mechanics and materials: the body in motion, mechanical properties of tissues, mechanical analysis of body parts and their motion, materials and their properties for biomechatronic engineering.

Module 3 Electrodes: applications of electrodes, recording and stimulation of bioelectronic signals, electrode-tissue interface.

Module 4 Sensors, power sources and control: covering a range of sensors, power sources and control strategies used in bio-mechatronics. Prosthetic electronic skins.

Module 5 Bioprinting: 3D printing technologies in biomedicine, Signals: signal acquisition, processing and analysis. Filters, ADC and amplification of bioelectronic signals.

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Certification Course

on

Cyber Security (CCCS 04)

Offered by

School of Computer Science and Engineering

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Why take up this course?

- To gain the ability to define the design, architecture, and management of an organization's security
- To perform data loss prevention and risk analysis
- To acquire an understanding of the security architecture, models, engineering, and cryptography
- To get familiar with network security and communications, identity and access management, operations, and security testing

Career Prospects of this course

- IT Directors
- IT Security Consultants
- Security Auditors
- IT Managers
- Security Analysts
- Directors of Security
- Security Managers
- Network Architects
- Security Systems Engineers
- Security Architects
- Chief Information Security Officers

Program Curriculum

Cyber Security Training Course Content

1. **SECURITY AND RISK MANAGEMENT**
    - Regulatory and legal issues
    - Confidentiality, availability, and integrity concepts
    - Principles of security governance
    - Compliance and professional ethics
    - Requirements of business continuity
    - Policies of personnel security
    - Threat modeling and risk considerations
    - Security education, awareness, and training
    - Security policies, standards, procedures, and guidelines
2. **ASSET SECURITY**
    - Privacy protection
    - Asset and information classification
    - Ownership
    - Data security controls and appropriate retention
    - Requirements handling
3. **SECURITY ARCHITECTURE AND ENGINEERING**
    - Security evaluation models
    - Fundamental concepts of security models
    - Security designs, architectures, and solution elements vulnerabilities

- Information systems security capabilities
- Using secure design principles for engineering processes
- Vulnerabilities of web-based and mobile systems
- Cryptography
- Vulnerabilities of cyber-physical systems and embedded devices
- Secure principles of facility and site design
- Physical security

4. COMMUNICATION AND NETWORK SECURITY

- Architectural design of a secure network
- Channels for secure communication
- Components of a secure network
- Network attacks

5. IDENTITY AND ACCESS MANAGEMENT (IAM)

- Logical/physical access to assets management
- Authentication and identification management
- Integrating identity as a third-party service
- Mechanism of authorization
- Provisioning life cycle's identity and access

6. SECURITY ASSESSMENT AND TESTING

- Test outputs (e.g., manual and automated)
- Security process data (e.g., operational and management controls)
- Vulnerabilities of security architectures
- Testing of security control
- Test and assessment strategies

7. SECURITY OPERATIONS

- Monitoring and logging activities
- Investigation requirements and support
- Incident management
- Resource provision
- Concepts of foundational security operations
- Recovery strategies
- Techniques of resource protection
- Physical security
- Measures of prevention
- Vulnerability and patch management
- Processes of change management
- Exercises and planning of business continuity
- Personnel safety concerns
- Plans and processes for disaster recovery

8. SOFTWARE DEVELOPMENT SECURITY

- Security controls for development environment
- Software development life cycle security
- Impact of acquired software security
- Effectiveness of software security

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Certification Course

on

Digital Marketing (CCBS 02)

Offered by

School of Business Studies

Shobhit Institute of Engineering and Technology

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Digital Marketing

Overview:
In simple terms, digital marketing is the promotion of products or brands via one or more forms of electronic media. Digital marketing is often referred to as online marketing, internet marketing or web marketing.

Duration: 40 Hrs.

Course Objectives:

Digital marketing objectives should be SMART (Specific, Measurable, Achievable, Relevant and Time Related); and you should benchmark against your competitors to ensure that you are more effective.

Pre-requisite / Target Audience:

- No prior knowledge about marketing or digital marketing is required
- Speak and write English fluently
- Have broadband internet access
- Have basic PC skills and online access
- Be over the age of 18
- Be fully committed to Squared!

Module 1: Introduction to Digital Marketing:

In this module you will learn what is digital marketing, and importance of digital marketing. And you will also learn what is web site and levels of web site, Difference between blog, portal & website.

- What is digital marketing?
- How is it different from traditional marketing?
- ROI between Digital and traditional marketing?
- Discussion on Ecommerce
- Discussion on new trends and current scenario of the world?
- Digital marketing a boon or a Bane?
- How can digital marketing be a tool of success for companies?
- Video on importance of digital marketing
- Analysis of recent info graphics released by companies about digital marketing?
- How did digital marketing help the small companies and top inc
- Categorization of digital marketing for the business
- Diagnosis of the present website and business.

- Swot analysis of business, present website and media or promotion plan.
- Setting up vision,mission,and goals of digital marketing

Understanding a website

- What is a website?
- Levels of websites?
- Diff b/w Blog, Portal and Website?
- Diff b/w websites either static or dynamic

Module 2: Search Engine Optimization (SEO):

In this module you will learn complete about SEO (Search engine Optimization, what is On page optimization, Off page optimization, and you also learn how to prepare a reports like- Keywords, titles, meta tags etc..

- On page optimization techniques
- Off page Optimization techniques
- Reports

Module 3: Social Media Optimization (SMO):

In this module you will learn how to do SMO (Social Media Optimization) like Facebook, Twitter, LinkedIn, Tumblur, Pinterest and more social media services optimization.

- Introduction to social Media Marketing
- Advanced Facebook Marketing
- Word Press blog creation
- Twitter marketing
- LinkedIn Marketing
- Google plus marketing
- Social Media Analytical Tools

Module 4: Search Engine Marketing:

In this module you will learn what SME (Search Engine Marketing) is a paid tool like Google Adwords, now a days we have so many paid tools we discuss is briefly and display advertising techniques and all.

- Introduction to Search Engine Marketing
- Tools used for Search engine Marketing
- PPC /Google Adwords Tool
- Display advertising techniques
- Report generation

Module 5: Additional Module:

In this module you will learn about tools for more useful to SEO, these tool used for analysis on website traffic, keyword analysis and also you can learn Email marketing and all.

- Google Analytics
- Online Reputation Management
- E-Mail Marketing
- Affiliate Marketing
- Social Media Analytics
- Ad designing

At the end of the course participants will be able to

1. Online & Offline SEO
2. Competitive Analysis For Smarter Marketing
3. You will learn how to use dozens of proven digital marketing strategies
4. You will learn how to use all of the most popular social media platforms to grow your business
5. You will see tangible results by taking action throughout the entire course
6. You will increase conversions and sales with real world techniques
7. You will improve your brand identity and grow your brand's audience

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Certification Course

on

Ethical Hacking (CCCS 03)

Offered by

School of Computer Science and Engineering

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Who is a Certi ied Ethical Hacker?

A Certified Ethical Hacker is a specialist typically working in a red team environment, focused on attacking computer systems and gaining access to networks, applications, databases, and other critical data on secured systems. A CEH understands attack strategies, the use of creative attack vectors, and mimics the skills and creativity of malicious hackers. Unlike malicious hackers and actors, Certified Ethical Hackers operate with permission from the system owners and take all precautions to ensure the outcomes remain confidential. Bug bounty researchers are expert ethical hackers who use their attack skills to uncover vulnerabilities in the systems.

Course Description

The Certified Ethical Hacker (CEH) credential is the most trusted ethical hacking certification and accomplishment recommended by employers globally. It is the most desired information security certification and represents one of the fastest-growing cyber credentials required by critical infrastructure and essential service providers. Since the introduction of CEH in 2003, it is recognized as a standard within the information security community. CEH v11 continues to introduce the latest hacking techniques and the most advanced hacking tools and exploits used by hackers and information security professionals today. The Five Phases of Ethical Hacking and the original core mission of CEH remain valid and relevant today: "To beat a hacker, you need to think like a hacker."

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Certi ied Ethical Hacker (CEH) Version 11

CEH provides an in-depth understanding of ethical hacking phases, various attack vectors, and preventative countermeasures. It will teach you how hackers think and act maliciously so that you will be better positioned to set up your security infrastructure and defend future attacks. Understanding system weaknesses and vulnerabilities help organizations strengthen their system security controls to minimize the risk of an incident.

CEH was built to incorporate a hands-on environment and systematic process across every ethical hacking domain and methodology, giving you the opportunity to work towards proving the required knowledge and skills needed to perform the job of an ethical hacker. You will be exposed to an entirely different posture towards the responsibilities and measures required to be secure.

In its 11th version, CEH continues to evolve with the latest operating systems, tools, tactics, exploits, and technologies. Here are some critical updates of CEH v11:

Incorporating Parrot Security OS

When compared to Kali Linux, Parrot Security OS offers better performance on lower-powered laptops and machines while offering an intuitive look and feel with a larger repository of general tools.

Re-Mapped to NIST/NICE Framework

CEH v11 is mapped rigorously to important Specialty Areas under the NIST/NICE framework's Protect and Defend (PR) job role category overlapping with other job roles, including Analyze (AN) and Securely Provision (SP).

Enhanced Cloud Security, IoT, and OT Modules

CEH v11 covers updated Cloud and IoT modules to incorporate CSP's Container Technologies (e.g., Docker, Kubernetes), Cloud Computing threats, and a number of IoT hacking tools (e.g. Shikra, Bus Pirate, Facedancer21, and more). This is critical as the world moves towards broader and deeper cloud adoptions.

Cloud-Based Threats

As the cloud industry is estimated to reach $354 billion by 2022, the businesses struggle to limit the frequency of data theft incidents due to misconfigured cloud environments. January to April 2020 alone saw a 630% spike in cloud-based attacks. Learn how to avoid, identify, and respond to cloud-based attacks with CEH v11.

IoT Threats

Market reports anticipate that the worldwide IoT-connected devices are expected to reach 43 billion by 2023. To support this rapid expansion, the prominent players of the internet, including Amazon Web Services, Google, IBM, Microsoft, are swiftly shifting to private cloud services, creating complexities in IoT ecosystems. Learn to deal with IoT-based attacks with the CEH v11 course that covers the latest IoT hacking tools, such as Shikra, Bus Pirate, Facedancer21, and many others.

Operational Technology (OT) Attacks

Last year, businesses experienced a 2,000% increase in OT based incidents. You can gain expertise in OT, IT, and IIoT (industrial IoT) to secure a critical enterprise OT/IoT deployments. To learn the advanced skills of OT, CEH covers concepts of OT, such as ICS, SCADA, and PLC, various challenges of OT, OT hacking methodology, tools, communication protocols of an OT network like Modbus, Profinet, HART-IP, SOAP, CANopen, DeviceNet, Zigbee, Profibus, etc., and gaining Remote Access using DNP3 protocol.

Modern Malware Analysis

CEH v11 now includes the latest malware analysis tactics for ransomware, banking and financial malware, IoT botnets, OT malware analysis, Android malware, and more!

Covering the Latest Threats - Fileless Malware

As the security community observed a rise in fileless attacks, it began to raise concerns about fileless malware attacks. As fileless malware is a relatively new form of malware attack, organizations find it difficult to detect with endpoint security solutions. With the CEH v11, you can now learn various fileless malware techniques with associated defensive strategies, as the course focuses on the taxonomy of fileless malware threats, fileless malware obfuscation techniques to bypass antivirus, launching fileless malware through script-based injection, launching fileless malware through phishing, and more.

New Lab Designs and Operating Systems

This latest iteration of CEH v11 includes new operating systems, including Windows Server 2019, Windows Server 2016, and Windows 10 configured with Domain Controller, firewalls, and vulnerable web applications for practicing and improving hacking skills.

Increased Lab Time and Hands-on Focus

More than 50% of the CEH v11 course is dedicated to practical skills in live ranges via EC-Council labs. EC-Council leads in this aspect of the industry.

Industry's Most Comprehensive Tools Library

The CEH v11 course includes a library of the latest tools required by security practitioners and pen testers across the world.

Course Outline

Module 01	Introduction to Ethical Hacking
Module 02	Footprinting and Reconnaissance
Module 03	Scanning Networks
Module 04	Enumeration
Module 05	Vulnerability Analysis
Module 06	System Hacking
Module 07	Malware Threats
Module 08	Sniffing
Module 09	Social Engineering
Module 10	Denial-of-Service
Module 11	Session Hijacking
Module 12	Evading IDS, Firewalls, and Honeypots
Module 13	Hacking Web Servers
Module 14	Hacking Web Applications
Module 15	SQL Injection
Module 16	Hacking Wireless Networks
Module 17	Hacking Mobile Platforms
Module 18	IoT and OT Hacking
Module 19	Cloud Computing
Module 20	Cryptography

What You Will Learn ?

- Key issues include plaguing the information security world, ethical hacking, information security controls, laws, and standards.
- Perform footprinting and reconnaissance using the latest footprinting techniques and tools as a critical pre-attack phase required in ethical hacking.
- Network scanning techniques and scanning countermeasures.
- Enumeration techniques and enumeration countermeasures.
- Vulnerability analysis to identify security loopholes in the target organization's network, communication infrastructure, and end systems.
- System hacking methodology, steganography, steganalysis attacks, and covering tracks to discover system and network vulnerabilities.
- Different types of malware (Trojan, Virus, worms, etc.), system auditing for malware attacks, malware analysis, and countermeasures.
- Packet sniffing techniques to discover network vulnerabilities and countermeasures to defend sniffing.
- Social engineering techniques and how to identify theft attacks to audit human-level vulnerabilities and suggest social engineering countermeasures.
- DoS/DDoS attack techniques and tools to audit a target and DoS/DDoS countermeasures.
- Session hijacking techniques to discover network-level session management, authentication/authorization, cryptographic weaknesses, and countermeasures.
- Web server attacks and a comprehensive attack methodology to audit vulnerabilities in web server infrastructure, and countermeasures.
- Web application attacks and comprehensive web application hacking methodology to audit vulnerabilities in web applications, and countermeasures.
- SQL injection attack techniques, injection detection tools to detect SQL injection attempts, and countermeasures.
- Wireless encryption, wireless hacking methodology, wireless hacking tools, and Wi-Fi security tools.
- Mobile platform attack vector, android vulnerability exploitations, and mobile security guidelines and tools.
- Firewall, IDS and honeypot evasion techniques, evasion tools and techniques to audit a network perimeter for weaknesses, and countermeasures.
- Cloud computing concepts (Container technology, serverless computing), various threats/attacks, and security techniques and tools.
- Penetration testing, security audit, vulnerability assessment, and penetration testing roadmap.
- Threats to IoT and OT platforms and learn how to defend IoT and OT devices securely.
- Cryptography ciphers, Public Key Infrastructure (PKI), cryptography attacks, and cryptanalysis tools.

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Target Audience

- Information Security Analyst / Administrator
- Information Assurance (IA) Security Officer
- Information Security Manager / Specialist
- Information Systems Security Engineer / Manager
- Information Security Professionals / Officers
- Information Security / IT Auditors
- Risk / Threat/Vulnerability Analyst
- System Administrators
- Network Administrators and Engineers

Suggested Course Duration

Minimum Hours: 40

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Certification Course

on

Internet of Things (CCCS 02)

Offered by

School of Computer Science and Engineering

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Certificate Course in Internet of Things (IOT) Using Arduino

Objective of the Course:

This Course focuses on hands-on IoT concepts such as sensing, actuation and communication. It covers the development of Internet of Things (IoT) prototypes—including devices for sensing, actuation, processing, and communication—to help you develop skills and experiences. The Internet of Things (IOT) is the next wave, world is going to witness. Today we live in an era of connected devices the future is of connected things.

Learning Outcome:

After the completion of the course, the students will be able design some IOT based prototypes

Duration of the Course: 60 Hrs.

Minimum Eligibility Criteria:

Pursuing/Passed BE/B.Tech/BCA/BSc.

COURSE OUTLINE

Sr. No.	Modules to be Covered
1	Introduction to IOT
2	Simulation Environment
3	Sensor & Actuators with Raspberry Pi
4	Basic Networking with Wi-Fi module
5	IoT Protocols
6	Cloud Platforms for IOT

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Contents to be covered

Module 1

Introduction to IoT: Architectural Overview, Design Principles and needed capabilities, IoT Applications, Sensing, Actuation, Basics of Networking, M2M and IoT technology Fundamentals, Devices and Gateways, Data management, Business Processes in IoT, Everything as a Service (XaaS), Role of cloud in IoT, Security aspects in IoT

Module 2

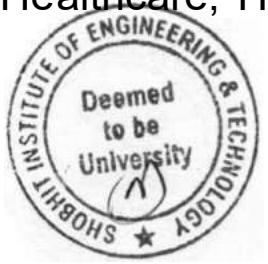
Elements of IoT: Hardware components- Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, i/O Interfaces, Software Components-Programming API's (using Python/Node js/Arduino) for Communication Protocols-MQTT, Zigbee, Bluetooth, CoAP, UDP, TCP.

Module 3

IoT Application Development: Solution framework for IoT Applications, Implementation of device integration, Data acquisition and integration, Device data storage-Unstructured data storage on cloud/local server, Authentication, Authorization of devices.

Module 4

IoT case Studies: IoT Case studies and mini projects based on Industrial automation, Transportation, Agriculture, Healthcare, Home automation



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Certification Course

on

Intellectual Property Rights

(CCLW 01)

Offered by

School of Law and Constitutional Studies

Shobhit Institute of Engineering and Technology

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Background

Indian Law Institute (ILI) has been the pioneer in the field of teaching and training of intellectual property laws and cyber laws. After having established a sound framework for the classroom teaching in these fields, we now plan to traverse the virtual world to embark on e-education.

By e-education is meant an innovative, on-line teaching technique for distance learning that utilizes the Internet for teaching purposes. E-education would bring teachers specializing in intellectual property issues closer to students in all corners of India through virtual means. This method allows students to undertake the ILI educational programs in intellectual property at their own place anywhere in India.

The Institute would use distance learning as an alternative and a complement to traditional training methods in order to make course materials accessible to large audiences throughout India.

About the course

Development of IPR is a recent phenomenon. It is still in a nascent stage and continuously evolving every passing day. Even the most learned legal luminaries find it difficult to solve the legal problems posed by technology. The Online Certificate Course offered by the institute, intends to spread awareness among the general public about the IPR, it is specifically beneficial to the lawyer community and the judges in the subordinate judiciary, who face cases on the daily basis.

The course is designed to give distant education wherein the students need not come to the institute for either classes or examination. The course will be conducted online and the subscribers need to operate from their respective places. All the queries of the subscribers relating to the admission or the conduct will be answered online.

Teaching procedure

The Institute's initiative takes full advantage of information technology and the Internet as an alternative and a complement to traditional training programs. It offers new teaching methodologies, specially-designed course materials, evaluation tools, tailored means of delivery, and greater accessibility.

Teaching would take place in the virtual environment of the Institute's Web site. A network of tutors on the panel of ILI will be available to guide the students. Students and teachers can interact as often as necessary during the course, because communication takes place through e-mail.

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At the end of the program, successful students receive a certificate acknowledging completion of the course.

Things that would take place on-line in the course:

- Registration
- Student-teacher interaction
- Student tests and assignments
- Course monitoring
- Evaluation

Who can pursue?

It is a general course which would be of immense value to persons who fall in the following categories:

- Students
- Lawyers
- Law enforcement personnel - customs officials, police officials, etc.
- Patent agents
- Intellectual Property Offices in Government Sector
- Engineers
- Scientists
- Software Professionals
- Company Executives
- Economists
- Journalists
- Government Officials

Syllabus

The syllabus is divided in four components:

- Patents
- Copyright and neighbouring rights
- Trademarks, Geographical Indications and Domain Names
- Management of Intellectual Property Rights

Duration

40 Hrs.

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Detailed Syllabus

Objectives:

- To introduce fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.
- To disseminate knowledge on patents, patent regime in India and abroad and registration aspects
- To disseminate knowledge on copyrights and its related rights and registration aspects
- To disseminate knowledge on trademarks and registration aspects
- To disseminate knowledge on Design, Geographical Indication (GI), Plant Variety and Layout Design Protection and their registration aspects
- To aware about current trends in IPR and Govt. steps in fostering IPR

Unit 1	Intellectual Property Rights: An overview	
Introduction and the need for intellectual property right (IPR) - Kinds of Intellectual Property Rights: Patent, Copyright, Trade Mark, Design, Geographical Indication, Plant Varieties and Layout Design – Genetic Resources and Traditional Knowledge – Trade Secret - IPR in India : Genesis and development – IPR in abroad - Major International Instruments concerning Intellectual Property Rights: Paris Convention, 1883, the Berne Convention, 1886, the Universal Copyright Convention, 1952, the WIPO Convention, 1967,the Patent Co-operation Treaty, 1970, the TRIPS Agreement, 1994		
Unit 2	**Patents**	
Patents - Elements of Patentability: Novelty, Non-Obviousness (Inventive Steps), Industrial Application - Non - Patentable Subject Matter - Registration Procedure, Rights and Duties of Patentee, Assignment and licence, Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties. Patent office and Appellate Board		

Unit 3	Copyrights	
Nature of Copyright - Subject matter of copyright: original literary, dramatic, musical, artistic works; cinematograph films and sound recordings - Registration Procedure, Term of protection, Ownership of copyright, Assignment and licence of copyright - Infringement, Remedies & Penalties – Related Rights - Distinction between related rights and copyrights		
Unit 4	**Trademarks**	
Concept of Trademarks - Different kinds of marks (brand names, logos, signatures, symbols, well known marks, certification marks and service marks) - Non-Registrable Trademarks - Registration of Trademarks - Rights of holder and assignment and licensing of marks - Infringement, Remedies & Penalties - Trademarks registry and appellate board		
Unit 5	**Other types of IP**	
Design Design: meaning and concept of novel and original - Procedure for registration, effect of registration and term of protection **Geographical Indication (GI)** Geographical indication: meaning, and difference between GI and trademarks - Procedure for registration, effect of registration and term of protection **Plant Variety Protection** Plant variety protection: meaning and benefit sharing and farmers' rights – Procedure for registration, effect of registration and term of protection **Layout Design Protection** Layout Design protection: meaning – Procedure for registration, effect of registration and term of protection		
Unit 6	**Current Regime & Scenario**	
India`s New National IP Policy, 2016 – Govt. of India step towards promoting IPR – Govt. Schemes in IPR – Career Opportunities in IP - IPR in current scenario with case studies		

Course Outcomes:

- The students once they complete their academic projects, shall get an adequate knowledge on patent and copyright for their innovative research works
- During their research career, information in patent documents provide useful insight on novelty of their idea from state-of-the art search. This provides further way for developing their idea or innovations
- Pave the way for the students to catch up Intellectual Property (IP) as a career option
    a. R&D IP Counsel
    b. Government Jobs – Patent Examiner
    c. Private Jobs
    d. Patent agent and Trademark agent
    e. Entrepreneur

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EDUCATION EMPOWERS

Certification Course

on

Linux Fundamentals

(CCCS 01)

Offered by

School of Computer Science and Engineering

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Linux Course Curriculum

Introduction to Linux

Learning Objective: In this module, you will be introduced to various features of Linux. You will learn history, open source licences, various Linux distributions and Linux installation

Topics:

- Need for Linux OS
- What is Linux
- History of Linux
- Relationship Between Unix And Linux
- Features of Linux
- False myths around Linux
- Where Linux is used?
- Components of a Linux OS
- The architecture of Linux OS
- Types of Kernel
- Shell
- Programming in Linux
- Linux Distribution
- Miscellaneous Linux Concepts
- Software Licencing
- Installation and initialisation of Linux
- Shell Scripting
- Practical Uses of Shell Scripting

Initialization of Linux

Learning Objective: In this module, you will understand the user interface, commands and tools, and file operations in Linux

Topics:

- Understand User Interface in Linux
- Implement basic Linux Commands and Tools
- vim Editor
- Advanced Linux Commands
- File System
- File System Comparisons
- File Attributes
- File Operations
- File System Characteristics
- File Access Methods
- Formatting and Partitioning
- Multiboot System
- Learn Packaging Management in Linux

Hands On/Demo:

- Linux Commands
- Vim Editor
- Creating partitions

User Administration

Learning Objective: In this module, you will learn about managing Users and perform Authentication

Configuration

Topics:

- Users in Linux
- User Configuration
- Adding/Deleting/Modifying Users
- Group Administration
- Password Aging Policies
- Switching Accounts
- Sudo
- Network Users
- Authentication Configuration
- SUID and SGID Executable
- SGID Directories
- The Sticky Bit
- Default File Permissions
- Access Control Lists (ACLs)
- Hidden Files

Hands On/Demo:

- Demo – sudo, chown and chmod
- Adding a user
- Delete user
- Modify user
- Hidden Files

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Boot and Package Management

Learning Objective: In this module, you will learn about the boot management system and configuring services to run at boot. You will understand package management, which includes installing and removing software and updating a Kernel RPM.

Topics:

- Kernel Configuration
- Boot Management
- Grub Bootloader Configurations
- Red Hat Package Manager
- YUM
- DPKG
- APT
- Build from the source code
- Libraries

Hands On/Demo:

- Sysctl
- Bootloader Configurations
- Red Hat Package Manager
- YUM
- DPKG
- APT

Networking

Learning Objective: In this module, you will learn about OSI layers and various protocols of networking in Linux

Topics:

- OSI layers and Protocols: IPv4, IPv6, TCP, UDP, FTP, TFTP, Telnet, SSH, HTTP, DNS, DHCP, ARP, ICMP etc.
- Packet capturing tools
- Linux commands/tools to troubleshoot networking: netstat, tcpdump, ip, etc.
- Linux utilities: e.g. dnsmasqd, samba server ftpd, webserver, netcat, scp etc.
- Linux Firewall: command, utility and usage.
- Security: SSH, SCP. Certificates, authentication, encryption etc.
- Remote log in: SSH, screen, VNC, etc.

Hands On/Demo:

- IP addresses
- DNS
- ICMP
- dnsmasq.conf
- IP tables

Linux Overview and Scripting

Learning Objective: In this module, you will learn process management, system calls and bash operations

Topics:

- Process Management
- Process Commands
- System Calls
- Output Redirection
- Special Variables in Bash
- Expect Script

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- Python Scripting
- Dictionaries

Hands On/Demo:

- Ps command
- Top command
- Kill command
- Expect

Linux for software development

Learning Objective: In this module, you will learn about programming languages, libraries and profiling tools

Topics:

- Programming languages overview
- Static and Shared libraries
- Compilers, debugger, IDE, ctags, make utility etc.
- Editors in Linux: vi, emacs,
- Troubleshooting and optimization using profiling tools
- Diff, patch and Configuration management system
- Test automation and CI/CD pipeline

Hands On/Demo:

- Libraries
- Makefile

Security Administration, Shell Script and Virtualization

Learning Objective: In this module, we will learn about Linux security administration and Virtualization

Topics:

- Security in IT Industry
- SELinux
- Information gathering tools
- Grub security
- TCP Wrappers
- Securing Shell
- ClamAV
- Virtualization

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Certification Course

on

MATLAB from beginner to advance level (CCEC 02)

Offered by

School of Electronics, Electrical and Mechanical Engineering

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Basic Course Description

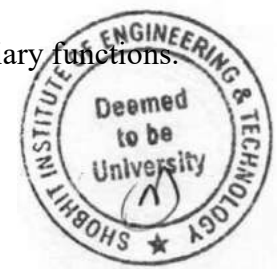
MATLAB (matrix laboratory) is one of the fundamental and leading programming languages and is a must learn skill for anyone who want to develop a career in engineering, science or related fields. Excellent **MATLAB programming skills** is therefore a crucial factor in making or breaking your career.

Duration: 40 Hrs.

This MATLAB course is one of the **most comprehensive MATLAB** courses which will take from **beginner to professional**. This course is designed from a perspective of a student who has **no prior knowledge of MATLAB and who is a MATLAB beginner.**

Throughout this comprehensive course, we cover a massive number of skills and techniques including:

- Basic mathematics and matrix manipulation functions
- Data import and visualization
- MATLAB Programming, problem solving, logic development and the use of customized functions
- Symbolic functions and variables for advance math operations
- File and directory handling
- Live scripts and sharing of results
- Advance data types including cells, tables, time tables and map containers
- Data science classification, clustering and dimensionality reduction with MATLAB
- Essential data preprocessing tasks such as outliers, missing values, categorical attributes handling
- Building regular expressions for textual processing
- Building GUIs using Guide and AppDesigner.
- Automating tasks by controlling mouse, keyboard, running scripts from command window, batch files
- Web, email and other internet related operations
- Generating ppts, word files and pdfs
- Code debugger and analyzer, exception handling, startup, finish and diary functions.



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What you'll learn

- Develop beginner to advance level skills of Programming with MATLAB. This is the only course which enables you to learn intermediate and advance programming data structures such as structures, tables, times tables, cells and map container.
- Gain Hands-On experience with MATLAB for visualizing, analyzing and formulating intermediate and some advanced level problems using MATLAB programming skills
- Experience some real-world applications of MATLAB in solving Data Science problems.

Requirements

- We cover everything from scratch and therefore do not require any prior knowledge of MATLAB
- The installation of MATLAB software on your machine is a must for this course so that you are able to run the commands and scripts that we cover during the course. If you do not have the MATLAB software installed than you may consider the following options
- 1. You may download a free trail copy of the software from the MATHWORK website. This is for limited time use
- 2. If you are student or employee, you may contact your School or employer for a free copy. Many universities offer a free student version of the software
- 3. You may consider downloading the Octave which is a free and has nearly identical functionality as that of MATLAB. (I would not recommend this option since you may not be able to have access to all the functions that we cover in this course)
- 4. If none of the above works for you, then you may purchase the student version directly from MathWorks website which is significantly lower in cost compare to its full version.

Basic Course Description

MATLAB (matrix laboratory) is one of the fundamental and leading programming language and is a must learn skill for anyone who want to develop a career in engineering, science or related fields. Excellent **MATLAB programming skills** is therefore a crucial factor in making or breaking your career.

This course is designed from a perspective of a student who has **no prior knowledge of MATLAB.** The course starts from the very basic concepts and then built on top of those basic concepts and move towards more advanced topics such as **visualization**, exporting and importing of data, **advance data types** and **data structures** and advance programming constructs.

To get the real feel of MATLAB in solving and analyzing real life problems, the course includes **machine learning topics in data science and data preprocessing.**

The course is fun and exciting, but at the same time we dive deep into MATLAB to uncover its power of formulating and analyzing real life problems. The course is structured into four different Parts. Below is the detailed outline of this course.

Part 1: MATLAB from Beginner to Advance

Segment 1.1: Handling variables and Creating Scripts

Segment 1.2: Doing Basic Mathematics in MATLAB

Segment 1.3: Operations on Matrices

Segment 1.4: Advance Math Functions with Symbolic Data Type

Segment 1.5: Interacting with MATLAB and Graphics

Segment 1.6: Importing Data into MATLAB

Segment 1.7: File Handling and Text Processing

Segment 1.8: MATLAB Programming

Segment 1.9: Sharing Your MATLAB Results

Part 2: Advance MATLAB Data Types

Segment 2.1: Cell Data Type

Segment 2.2: Tables and Time Tables

Segment 2.3: Working with Structures and Map Container Data Type

Segment 2.4: Converting between Different Data Types

Part 3: Machine Learning for Data Science Using MATLAB

Segment 3.1 Data Preprocessing

Segment 3.2. Classification

Segment 3.2.1 K-Nearest Neighbor

Segment 3.2.2 Naive Bayes

Segment 3.2.3 Decision Trees

Segment 3.2.4 Support Vector Machine

Segment 3.2.5 Discriminant Analysis

Segment 3.2.6 Ensembles

Segment 3.2.7 Performance Evaluation

Segment 3.3 Clustering

Segment 3.3.1 K-Means

Segment 3.3.2 Hierarchical Clustering

Segment 3.4 Dimensionality Reduction

Segment 3.5 Project

Part 4: Data Preprocessing for Machine Learning using MATLAB

Segment 4.1 Handing Missing Values

Segment 4.2 Dealing with Categorical Variables

Segment 4.3 Outlier Detection

Segment 4.4 Feature Scaling and Data Discretization

Segment 4.5 Selecting the Right Method for your Data

Who this course is for:

- Anyone looking to build a strong career in science or engineering through Excellent MATLAB coding skills
- Anyone wanting to advance their skills of real-world problem solving with MATLAB based scientific computing

By taking this course, you will become a **fluent** MATLAB programmer and you'll be so good so that you can get a reasonable job offer as a MATLAB developer and use the language professionally.

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Certification Course

on

Personality Development and Soft Skills (CCBS 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
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Personality Development and Soft Skills

INTENDED AUDIENCE : Students, Teachers, Professionals, Trainers, Leaders, Employers

DURATION: 40 Hrs.

INDUSTRIES APPLICABLE TO: All industries/companies/organizations will recognize and value this course and recommend this for their employees and trainee programs.

COURSE OUTLINE :

The course aims to cause a basic awareness about the significance of soft skills in professional and inter-personal communications and facilitate an all-round development of personality. Hard or technical skills help securing a basic position in one's life and career. But only soft skills can ensure a person retain it, climb further, reach a pinnacle, achieve excellence, and derive fulfilment and supreme joy. Soft skills comprise pleasant and appealing personality traits as self-confidence, positive attitude, emotional intelligence, social grace, flexibility, friendliness and effective communication skills.

COURSE PLAN :

Week 01 : Introduction: A New Approach To Learning, Planning And Goal-Setting, Human Perceptions: Understanding People, Types of Soft Skills: Self-Management Skills, Aiming For Excellence: Developing Potential And Self-Actualisation, Need Achievement And Spiritual Intelligence.

Week 02 : Conflict Resolution Skills: Seeking Win-Win Solution, Inter-Personal Conflicts: Two Examples, Two Solutions, Types of Conflicts: Becoming A Conflict Resolution Expert, Types of Stress: Self-Awareness About Stress, Regulating Stress: Making The Best out of Stress.

Week 03 : Habits: Guiding Principles, Identifying Good And Bad Habits, Habit Cycle; Breaking Bad Habits, Using The Zeigarnik Effect For Productivity And Personal Growth, Forming Habits of Success.

Week 04 : Communication: Significance Of Listening, Active Listening, Barriers To Active Listening; Telephone Communication: Basic Telephone Skills, Advanced Telephone Skills, Essential Telephone Skills.

Week 05 : Technology And Communication: Technological Personality?, Mobile Personality?, E-Mail Principles, How Not To Send E-Mails!, Netiquette, E-Mail Etiquette.

Week 06 : Communication Skills: Effective Communication, Arising Out Of Sender/Receiver's Personality; Barriers To Communication: Interpersonal Transactions, Miscommunication; Non-Verbal Communication: Pre-Thinking Assessment-1 & 2.

Week 07 : Nonverbal Communication: Introduction And Importance, Issues And Types, Basics And Universals, Interpreting Non-Verbal Cues; Body Language: For Interviews, For Group Discussions.

Week 08 : Presentation Skills: Overcoming Fear, Becoming A Professional, The Role Of Body Language, Using Visuals, Reading Skills: Effective Reading, Human Relations: Developing Trust And Integrity.

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Certification Course

on

Retail Management (CCBS 03)

Offered by

School of Business Studies

Shobhit Institute of Engineering and Technology

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Retail Management

Certification Code

This integrated certificate course in retail management, concentrates on the Retail sector's emerging and the most prevalent trends. The Retail world's most crucial aspects like Category Management, Retail Buying, Store Operations, Customer Marketing and Retail Strategies have been rightly explored. This may help individuals embark on a career in one of the many roles in the Retail industry.

Why should one take this certification?

This Course is intended for professionals and graduates wanting to excel in their chosen areas. It is also well suited for those who are already working and would like to take certification for further career progression.

Earning Vskills Retail Management Professional Certification can help candidate differentiate in today's competitive job market, broaden their employment opportunities by displaying their advanced skills, and result in higher earning potential.

Who will benefit from taking this certification?

Job seekers looking to find employment in retail departments of various companies, students generally wanting to improve their skill set and make their CV stronger and existing employees looking for a better role can prove their employers the value of their skills through this certification.

Course Duration

30 Hrs.

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Table of Contents

7. The Demand-Driven Supply Chain

7.1 Vision for The Demand-Driven Supply Chain
7.2 The Path From Forecast-Driven To Demand-Driven Supply Chain
7.3 Demand-Driven Tools And Techniques
7.4 Sponsoring The Demand-Driven Supply Chain

8. Product Tracking Along Retail Supply Chains

8.1 Introduction
8.2 Low Tech Retailing
8.3 Beyond Basic Bar Codes
8.4 Radio Frequency Identification
8.5 Tracking In Transit
8.6 The Future Of Product Tracking

9. Understanding Supply Chain Costs

9.1 Introduction
9.2 Barriers To Cost Visibility
9.3 Goal: Activity-Based Costing By Product
9.4 The Starting Point (i-a)
9.5 Department Costs With Capital Recovery (ii-b)
9.6 Multicompany Process Cost (iii-c)
9.7 Activity-Based Costs By Product (iv-d)
9.8 Understanding costs—summary

10. Retail Return

10.1 Introduction
10.2 Genco Case Study—The Rise Of The Return Loop
10.3 Types of Returns
10.4 Opportunities In Returns

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Certification Course

on

Solar Power Technology

(CCEE 01)

Offered by

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

SOLAR POWER TECHNOLOGY

PRE-REQUISITES : Basic knowledge of heat transfer, thermodynamics and fundamentals of physics

COURSE DURATION: 35 Hrs.

INTENDED AUDIENCE : UG, PG and Doctorate students

INDUSTRIES APPLICABLE TO : This course will be very much effective for the engineers working in the Solar Industries

COURSE OUTLINE :

The course content is designed to provide comprehensive knowledge on solar radiation, analysis of solar radiation data, fundamentals of the solar thermal and photovoltaic system along with storage of energy required for effective design of efficient solar energy conversion devices. The concepts will be illustrated with practical examples, schematics and block diagrams wherever required. A sufficient number of numerical problems with solutions will be discussed in the course. This course is specifically designed for undergraduate and postgraduate students of Energy Engineering and Technology. Further, the course will be very much useful for students and researchers from varied academic backgrounds for the synthesis of novel energy conversion devices and processes.

COURSE PLAN :

Week 1: Energy Scenario, overview of solar energy conversion devices and applications, physics of propagation of solar radiation from the sun to earth.

Week 2: Sun-Earth Geometry, Extra-Terrestrial and Terrestrial Radiation, Solar energy measuring instruments

Week 3: Estimation of solar radiation under different climatic conditions, Estimation of total radiation

Week 4: Fundamentals of solar PV cells, principles and performance analysis, modules, arrays, theoretical maximum power generation from PV cells

Week 5: PV standalone system components, Standalone PV-system design.

Week 6: Components of grid-connected PV system, solar power plant design and performance analysis.

Week 7: Fundamentals of solar collectors, Snails law, Bougers law, Physical significance of Transmissivity - absorptivity product.

Week 8: Performance analysis of Liquid flat plate collectors and testing

Week 9: Performance analysis of Solar Air heaters and testing

Week 10: Solar thermal power generation (Solar concentrators).

Week 11: Thermal Energy Storage (sensible, latent and thermo-chemical) and solar pond

Week 12: Applications: Solar Refrigeration, Passive architecture, solar distillation, and emerging technologies.

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Workshop on on Entreprenureship Awareness

Date:
22 Sept.
to
08 Oct. 2016

Venue:
University Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

University Training and Development Cell

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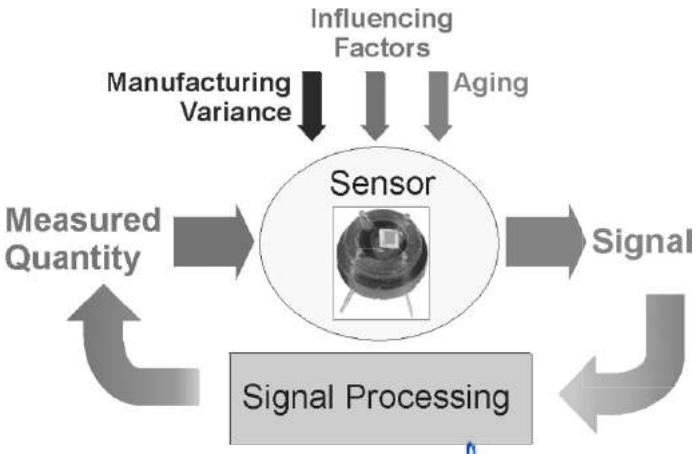
EDUCATION EMPOWERS

School of Engg. and Tech. invites you for workshop On

Signal Processing and its Application



Date
22 Sept.
to
4 Oct. 2016

Time
2:00 pm
to
5:00 pm

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Organized By

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Career Oriented Workshop

Date:
21 Nov.
to
3 Dec 2016

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

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EDUCATION EMPOWERS

Workshop on Training Module for Internship/Resume

Date:
10 Oct.
to
26 Oct. 2016

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

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EDUCATION EMPOWERS

Workshop on

Website Designing in Realtime

Date:
01 June
to
15 June
2017

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Computer Science and Engineering

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EDUCATION EMPOWERS

Short Term Course on Software Testing

Date:
12 June
to
27 June
2017

Venue:
University Auditorium

Time:
2:00 pm to
5:00 Pm

Organized by

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EDUCATION EMPOWERS

Short Term Course on Cloud Computing

Date:
30 June
to
15 July
2017

Venue:
University
Auditorium

Time:
2:00 pm to
5:00 Pm

Organized by

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EDUCATION EMPOWERS

Workshop on on International Career Path to Study Abroad

Date:
16 August
to
02 Sept. 2016

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

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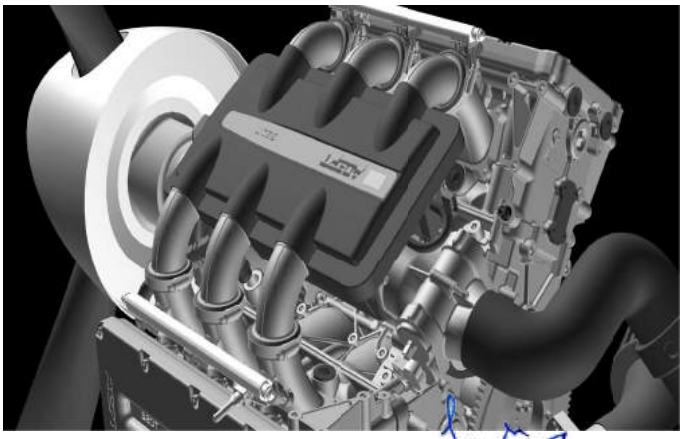
EDUCATION EMPOWERS

"An Investment in Knowledge pays the best interest"

School of Engineering and technology invites you for certification Course on

"AUTOCAD"

Date: 11 May to 29 May 2017



Timings: 10:00 am to 1:00 pm daily

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Department of Mechanical engineering

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COURSE DETAILS

This course will provide the college students a base to automotive technology. They will learn about each and every driving systems involved in automation and get better understanding and grip on its application.

COURSE MODULE

AUTOMOTIVE COURSE SYLLABUS (3 Days)

1. Introduction to automobile
   - Review of Auto basics
   - Automobile Working Cycle
   - Basic Terms such as HP, Torque, Sp Fuel consumption, Gradiability, Wheel bases, Turning radius, Tracks, Road reactions, Vehicle stability etc
2. Introduction to Passenger Cars
   - Passenger Car Types
   - Latest Car Models
3. Modern Car engines
   - Multipoint Injection Petrol engine
   - Common Rail Direct Injection Diesel engine
4. Modern Diesel Engines
   - FIP
   - ECU
   - Common rail injection Systems
5. Clutch
6. Transmission
7. Differential working /Functioning
8. Suspension
   - Independent suspension
   - Antiroll bars
   - Torsion bars
   - Stabilizers

PRACTICAL SESSION DETAILS (3 Days)

1. Parts study on following automotiveparts
   - Engine Assembly
   - Clutch Assembly
   - Gear Assembly
   - Carburetor System
   - Other Parts (brakes, ignition system etc.)
2. Study of under body parts - Location and inter connectivity(through presentation)
3. Assembly of an Automobile

COURSE FEES

Rs. 500 per Individual

BENEFITS OF COURSE

- A certificate of participation to trainees for the Course on "Automobile Basics & Advanced System Study".
- The course providing insight into the structure and function of each component; vehicle integration; and related terms and working.
- Knowledge about appropriate use of sensors, actuators and mechanisms in Mechatronics applications.
- An approach to new technologies & technica advancement in modern cars will be taught. Helpfu in training/internships/placements.
- STUDY KIT will be provided to every participant.

RESOURCE PERSON

Expert's Profile	Contact
Mr. Rajkishor Singh Head of Mechanical and Mechatronics Engineering Shobhit University Meerut Ph.D. from Shobhit University, Meerut (P) M.Tech. from U.P.T.U. Lucknow, U.P. B.Tech. from BIET Jhansi, U.P.	956823720
Mr. Jitendra Jadon Assistant Professor Shobhit University Meerut M.Tech. from Subharti University Meerut	9045069376
Mr. Raman Gahlaut Assistant Professor Shobhit University Meerut M.Tech (P) From NITTTR Chandigarh (P.U.) B.Tech. from U.P.T.U. Lucknow U.P.	7599340878

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Shobhit University

(Shobhit Institute of Engineering & Technology)

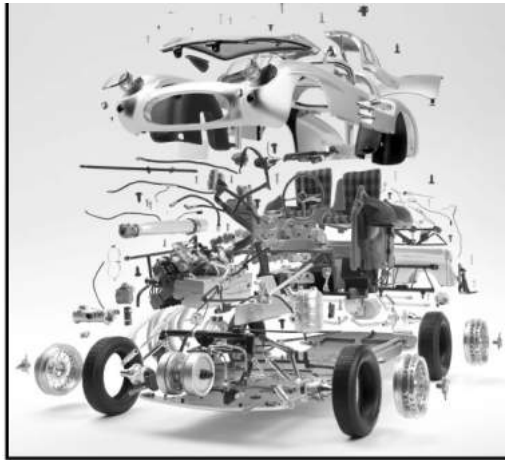
EDUCATION EMPOWERS

Established u/s 3 of UGC Act, 1956

A NAAC Accredited University

Summer Short Term Course on Automotives

12th June - 26th June 2017



Organized By

Mechanical Engineering Department

SHOBHIT UNIVERSITY, MEERUT

About Shobhit University

In 1989, 25 years ago, the organisation started its journey to empower the nation through education, specifically in rural India under the patronage of NICE society, envisaged by Babu Vijendra Kumar Ji, an illustrious agriculturist and social worker. Shobhit University aspires to construct an abode of knowledge which together with the creativity of mind will have the potential to attenuate the darkness and will actively contribute in the transformation of the world towards betterment. The University aims to make a tributary, facultative educational climate to facilitate integration of the younger generation into the logic of the current system and to develop instructional means for the betterment of the world. As a testimony to the mission and enterprise, the university has now come of age an offers a wide range of Mechanical & Mechatronic Engineering programs in Computer Engineering an IT, Electronics Engineering, Business Management Biotechnology, Biomedical Engineering Bioinformatics and Agri-informatics. The University aims to fulfil the mission to empower our youth particularly in rural areas through quality education and to turn intellect into empowerment through severa novel initiatives. We remain passionate about our etho and traditions as we look forward to a new resurgen India. The institution aspires in promoting skil development initiatives relevant to industries an global community at large through it Internationa Skills development centre. Shobhit University retain its coveted position in the list of country's mos emerging university and ranked among top 5 universities by various survey agencies. It has a stron record of collaborative research with number o projects involving many reputed laboratories o national and international importance which enable the university to bring laurels. University has signe memorandum of understanding with five universitie around the globe for faculty and student exchang programs. The University fosters intellectual curiosity and provides opportunities for effective research abilities.

The University campus is cosmopolitan having a diverse pool of students from all parts of the subcontinents and other countries. Apart from the conventional way of teaching, the University regularly organize workshops and seminars on recent trends on science and technology focussing the upliftment of the students. The University takes pride in its commendable placement record and a very dynamic globally placed Alumni Network. The Universi elieves that education empowers and therefore it aims to create a conductive, enabling, academic climate to facilitate integration of the younger generation into logic of the present system .

About the Department

The Department of Mechanical Engineering provides strong background to Engineering Student s to cope up with the needs of emerging technology at National and International levels. The Department is the pioneer in offering Under Graduate course in Mechanical and Mechatronics Engineering and Post Graduate course in Mechanical Engineering besides Ph.D. programme in he different related research areas.

The department is having highly qualified and experienced faculty in all streams of Mechanical Engineering.Today, the world of Mechanical Engineering changes under the influence of advanced computational tools, improved simulation and analysis, and entirely different manufacturing rotocols. This has opened up new vistas of research in the department, such as Fracture Mechanics, Rapid Prototyping, Computational Heat Transfer, Solar Energy, Advanced Materials, Supply Chain Management, Advanced Manufacturing Processes, CAD/CAM/CIM, Robotics and Mechatronics, Operations Management, Energy Management, and Control Engineering.

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Registration Form

ame .....

Date of Birth .....

Gender .....

Designation .....

Highest Qualification .....

Specialization .....

Organization .....

ddress of Communication .....

Phone/Mobile .....

E mail .....

Date .....

Signature of Applicant

Registration Fee

- Registration fee : Rs 500/-

Contact Person:

Mr. Raj Kishor Singh
Mechanical Engineering Deptt.
Shobhit University
NH-58, Modipuram, Meerut-250 110
Mobile. : 09568237207
E-mail : rajkishore@shobhituniversity.ac.in

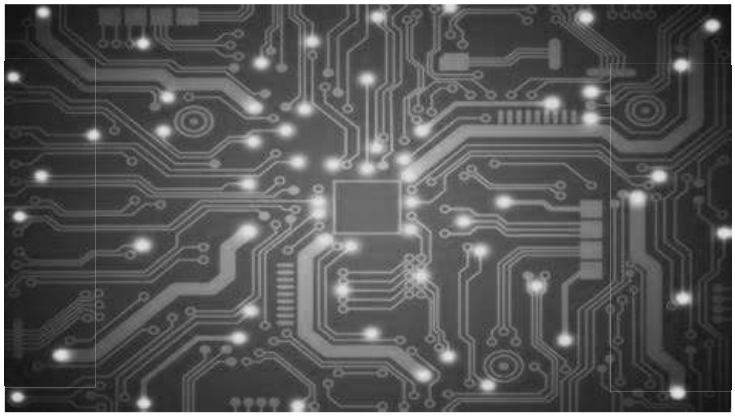
Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

School of Engg. and Tech. invites you for

Workshop on

Realtime Implementation of Digital Circuits

Date
22 June. to
4 July.
2016



Time
2:00 pm
to
5:00 pm

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Organized By

Department of Electronics and Communication Engineering

Shobhit Institute of Engineering & Technology, Meerut

(A NAAC Accredited Deemed-to-be University)

NH-58, Modipuram, Meerut - 250 110

Website: www.shobhituniversity.ac.in

Shobhit
Institute of Engineering & Technology
Deemed to-be-University

EDUCATION EMPOWERS

Workshop on

Wordpress Website Design

Date:
16 June
to
30 June
2017

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Computer Science and Engineering

Shobhit Institute of Engineering & Technology, Meerut

(A NAAC Accredited Deemed-to-be University)

NH-58, Modipuram, Meerut - 250 110

Website: www.shobhituniversity.ac.in

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Shobhit
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EDUCATION EMPOWERS

Certification Course

on

Acoustical Physics of Music

(CCAS 01)

Offered by

School of Basic and Applied Sciences

Shobhit Institute of Engineering and Technology

(Deemed to be University)

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
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Acoustical Physics of Music

Prerequisites: None

Course Objective: To provide a fundamental physical understanding of the nature of sound, hearing, and music.

Course Duration: 40 Hrs.

Course Description:
We will begin to explore increasingly intricate aspects of how simple waves are combine in extremely precise ways to create the complex sounds we experience in everyday life, with a focus on how our perception of these sounds works, how the phenomenon of music arises, how certain instruments create their own unique versions of it, and how music is recorded and/or presented to an audience. We understand that most of you are not majors in science or engineering, so some of the technical concepts will be new to you.

Unit 1. Oscillations, Waves and Sound

Simple harmonic oscillations. Amplitude, period, and frequency (pitch). Harmonic oscillations with slowly changing parameters. Perception of sound. Combinations of harmonic oscillations. Beats. Phase relations and psychoacoustical Ohm's law, phase beats. Damped and driven oscillations, resonance. Periodic waves, solitary waves, wave packets. Wave length, sound velocity. Spherical and cylindrical waves. Longitudinal and transverse waves. Surface acoustic waves. Reflection and refraction of waves. Refraction of sound in the atmosphere. Doppler effect. Sonic booms and shock waves.

Unit 2. Standing Waves and Overtone Series

Standing waves in general. Role of boundary conditions in the formation of standing waves. Node-node, antinode-antinode, and node-antinode boundary conditions. Overtone's series. Mersenne's laws. Analysis and Synthesis of Complex Waves: Synthesis of complex waves. Fourier analysis and Fourier spectra. Analysis of tone quality: Attacks and decays, formants. Vibrato and tremolo. Discrete and continuous Fourier spectra. Spectrograms: Narrow-band and wide-band.

Unit 3. Hearing, Speech and singing

Transmission of the signal through the ear parts. Place theory of hearing: Frequency response and frequency resolution. amplitude and the intensity of the sound. neurophysiology of the hearing process. Sensitivity of the ear to the sound intensity. The decibel scale of sound

intensity level. Nonlinearity of the ear. Aural harmonics. Combinational tones. Fundamental tracking. Cochlear implants as a confirmation of the place theory of hearing. Structure of speech and singing apparatus. Throat and mouth as a resonator. Naive open-closed-pipe theory of the throat-mouth resonator. Resonances as formants in shaping the output sound. Production of the glottal wave by the vocal folds, Bernoulli law. Difference between singing, speech, and hoarse speech. Simplified two-formant synthesis of vowels.

Unit 4. Room and auditorium acoustics

Direct and reflected sound. Texture of the echo. Definition of the reverberation time. Fullness and clarity. Warmth and brilliance. Formula for the reverberation time. Absorption and reflection coefficients. Resonances in room of a box. shape. General principles of constructing concert halls. architectural acoustics and the science of reverberation, Sabine equation. Basic parameters, design and modification of spaces using different types of absorbers and treatments. Active methods of noise reduction and room treatment (e.g., phantom acoustic shadows). Diffusion through reflection-phase gratings (quadratic-residue and primitive-root diffusers). Helmholtz resonators. Room dimensions.

Unit 5. Equipment used for recording music

Microphones and preamplifiers, analog (tape and records) and digital formats for recording. **Home playback and reproduction of music** – general categorization of mass-Fi, mid-Fi and HiFi qualities and philosophies. Sources (tape, record, CD, DVD-audio, SACD, etc.), preamplifiers (tubes and solid-state, chips vs discrete), amplifiers, speakers (dynamic, electrostatic, planar magnetic, etc.). Room choice and placement of components. Wiring and interfacing (concept of impedance mismatch and mechanical and dielectric degradation). **Working of some acoustical and electronic musical instruments** – electric guitar and its effects, etc.

Learning outcomes: At the end of this course students will be able to

1. Understand how a harmonic oscillator works and the concepts of resonance and formants.
2. Understand the concepts and interrelationships between wavelength, frequency, and speed of a wave.
3. Understand the origin of harmonics in string and wind instruments.
4. Understand the concepts of loudness, intensity levels and decibels.
5. Understand some basics of the neurophysiology of the hearing process and the causes of hearing loss.
6. Understand tones and the basic of musical scales.

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EDUCATION EMPOWERS

Certification Course

on

Automotive Technology Level 1

(CCME 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
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Course Descriptions and Outlines

Automotive Technology

Level 1

Course Description

Duration: 60 Hrs.

Term: 3 Hours per day

Prerequisite: none

Description: This is the study of an automobile. There will be a hands-on experience class involving activities that relate directly to maintenance, repair and service. The program of instruction may include: safety in the shop, care and use of tools, interpretation of parts books, parts handling, engine construction, ignition systems, fuel systems, charging systems, starting systems, electronic systems, chassis wiring and diagrams, brakes, lubrications and minor tune-up. Students may be involved in BMW Skill Next Program.

Course Outline

Orientation	Introduce Develop Master
A. Occupational outlook	I
B. Places that employ auto mechanics	I
C. Student requirements for the auto mechanics program	I/D
D. Steps involved in automotive shop work	I/D
E. Skills USA	I
F. Ways Skills USA state and national dues are used	I
G. Mandan automotive program rules	I/D
H. MSDA	I/D
I. Personal information sheet	I/D/M
J. Follow instructions sheet	I/D/M
K. Job application form	I/D/M

Safety	
I. Safety	
A. Terms related to the unit	I/D/M
B. Colors and application of the safety color code	I/D/M
C. Personal safety rules	I/D/M
D. General shop safety rules	I/D/M
E. Safety rules involving hand tools	I/D/M
F. Safety rules involving the engine	I/D/M
G. Battery safety	I/D/M
H. Safety rules involving flammable liquids	I/D/M
I. Equipment safety rules	I/D/M
J. Components of the fire triangle	I/D/M
K. Classes of fire	I/D/M
L. Types of fire extinguishers	I/D/M
II. Machine Safety Rules	
A. Parts washer	I/D/M
B. Engine hoist	I/D/M
C. Grinder	I/D/M
D. Hydraulic press	I/D/M
E. Drill press	I/D/M
F. Hoist	I/D/M
G. Floor jack	I/D/M
H. Pressure washer	I/D/M
III. Automotive lift	
A. Safety tips	I/D/M
B. Safety pledge form	I/D/M
IV. Safety Review	
A. Individual Student Shop Safety Inspection Form	I/D/M
Hand Tools	
A. Purpose of hand tools & storage	I/D/M
B. Types of screwdrivers	I/D/M
C. Types of pliers	I/D/M
D. Types of wrenches	I/D/M
E. Components of a socket set	I/D/M

F. Types of sockets	I/D/M
G. Special purpose sockets	I/D/M
H. Types of hammers used in the auto shop	I/D/M
I. Types of punches	I/D/M
J. Types of chisels	I/D/M
K. Types of files	I/D/M
L. Types of file teeth	I/D/M
M. Types of parts cleaning tools	I/D/M
N. General shop tools	I/D/M
O. Battery service tools	I/D/M
P. Starter service tools	I/D/M
Q. Charging system service tools	I/D/M
R. Ignition service tools	I/D/M
S. Fuel system service tools	I/D/M
T. Exhaust system service tools	I/D/M
U. Cooling system service tools	I/D/M
V. Lubrication service tools	I/D/M
W. Brake service tools	I/D/M
X. Front-end service tools	I/D/M
Y. Engine repair tools	I/D/M
Z. Drive line service tools	I/D/M
AA. General Torque Specification Chart	I
Rules and Measures	
I. Rules	
A. Terms related to the unit	I
B. Basic units of measurement	I/D
C. Fractional units found on rules	I/D
D. Decimal units found on rules	I/D
E. Metric units found on rules	I/D
F. Rules used in shop work	I
G. Uses of the rule with accessories	I
H. Procedure for using rules	I/D
I. Steps for reading the rules	I/D
II. Outside micrometer	
A. Types of measurements found on the outside micrometer	I/D/M
B. Major parts of the outside micrometer	I
C. Steps in selecting the proper size outside micrometer	I/D/M

D. General rules for use and care of micrometers	I/D
E. Definition of "feel" when using a micrometer	I/D
F. Methods of checking accuracy of outside micrometers	I/D/M
G. Reading the plane micrometer	I/D/M
H. Reading the vernier micrometer	I/D/M
Service Manuals	
A. Car information section	I/D/M
B. General service information section	I/D/M
C. Carline unit index	I/D/M
D. Specification sheets	I/D/M
E. Repair information section	I/D/M
F. Labor and parts guide	I/D/M
G. Repair order	I/D/M
Electrical Unit	
I. Basic electrical theory	
A. Terms related to basic electricity	I
B. Parts of the atom and their values	I
C. Electricity according to the electron theory	I
D. Basic factors of electrical flow in a circuit	I
E. Relationship of voltage, amperage, and ohms to current flow	I/D
F. Ohms Law	I/D/M
G. Calculating problems using Ohms Law	I/D/M
H. Factors effecting resistance in a conductor	I/D
I. Basic electrical symbols	I/D/M
J. Components of a basic electrical circuit	I/D/M
K. Types of electrical circuits	I/D/M
L. Instruments for testing electrical circuits	I/D/M
M. Methods of connecting test instruments	I/D/M
N. Basic electrical circuit failures	I/D
O. Characteristics of magnetism	I/D
P. Characteristics of electromagnetism	I/D
Q. Electromagnetic induction	I/D
R. Factors determining magnitude of induce voltage	I/D

II. Battery service	
A. Terms related to the battery	I
B. Functions of a battery	I/D
C. Purposes of the battery parts	I/D
D. Converting chemical energy into electrical energy	I/D
E. Factors affecting battery voltage and capacity	I/D
F. Battery capacity in amperes	I/D
G. Types of battery rating	I/D
H. Safety rules	I/D/M
I. Features of a service-free battery	I
J. Jump starting a vehicle	I/D
III. Charging system	
A. Purpose of the charging system	I/D
B. Terms related to the charging system	I
C. Charging system components	I
D. Parts of the generator	I
E. Parts of the alternator	I/D/M
F. Differences between an alternator and generator	I/D
G. Advantages of a alternator over a generator	I/D
H. Reason an alternator produces more current at low speed than a generator	I/D
I. Stator construction	I/D
J. Types of stator windings	I/D
K. Current and voltage regulation in an alternator	I/D
L. Types of voltage regulators for alternators	I/D
M. Troubleshooting the charging system	I/D/M
IV. Starting system	
A. Terms related to the starting system	I/D
B. Purpose of the starting system	I/D
C. Operating principle of the starter	I
D. Magnetic principles of the starter	I
E. Path of current flow in a series wound starter	I
F. Components of the starting system	I/D
G. Types of starter switches	I/D
H. Parts of the starter	I/D/M
I. Major parts of the gear reduction starter	I/D/M
J. Types of starter drives	I/D
K. Components of a starter control circuit	I/D
L. Starting system control circuit components and their functions	I/D
M. Troubleshooting the starting system	I/D/M

V. Ignition system	
A. Terms related to the ignition system	I/D
B. Purpose of the ignition system	I/D
C. Components of the ignition system	I/D
D. Function of the ignition system components	I/D
E. Distributor components	I/D/M
F. Components of the ignition system circuits	I/D
G. Operation of the ignition system	I/D
H. Parts of the spark plug	I
I. Spark plug heat ranges	I
J. Spark plug conditions and their causes	I/D/M
K. Types of secondary ignition cables	I/D
L. Transistorized and capacitive discharge ignition system	I
M. Relationship of the electronic ignition system to the conventional ignition system	I/D
N. Advantages of the electronic ignition system	I/D
O. Major components of the electronic ignition system	I/D/M
P. Function of the components of the electronic ignition system	I/D
Q. Operation of the electronic ignitions system	I/D
VI. Chassis wiring	
A. Terms related to chassis wiring	I
B. Electrical symbols	I/D
C. Types of electrical terminals and connectors	I/D
D. Types of bulbs used in automobiles	I
E. Parts of the sealed beam	I
F. Differences between hot and ground circuits	I/D
G. Facts about voltage drop	I/D/M
H. Facts about current draw	I/D/M
I. Single and two-wire circuits	I/D
J. Instruments used in testing automobile electrical circuits	I/D/M
K. Steps in diagnosis of an electrical problem	I/D/M
L. Characteristics of a wiring diagram	I/D/M
M. Parts of a typical circuit identification code	I/D/M
Brake Unit	
I. Wheel bearings	
A. Terms related to unit	I/D
B. Types of front wheel bearings	I/D/M
C. Parts of a tapered roller front wheel bearing assembly	I/D/M

D. Characteristics of quality wheel bearing grease	I
E. Precautions to observe while packing wheel bearings	I/D/M
II. Brake systems	
A. Purpose of the brake system	I/D
B. Terms related to unit	I/D
C. Components of the standard brake system	I/D/M
D. Components of the tandem or dual brake system	I/D/M
E. Parts of a standard master cylinder	I/D/M
F. Parts of a tandem master cylinder	I/D/M
G. Parts of a wheel cylinder	I/D/M
H. Parts of a standard brake assembly	I/D/M
I. Types of self-adjusting brake systems	I/D
J. Brake operation	I/D/M
III. Power disc brakes	
A. Terms related to unit	I/D
B. Major components of the disc brake system	I/D
C. Disc brake components and their functions	I/D
D. Types of disc brake calipers	I
E. Parts of a floating caliper disc brake	I/D/M
F. Characteristics of disc brakes	I
G. Reasons disc brakes may require power booster units	I/D
H. Sources of energy used for power boosters	I
I. Types of vacuum operated power boosters	I/D
J. Major parts of a vacuum operated power booster	I
K. Major parts of a hydro-boost power booster	I
L. Operation of the vacuum suspended power booster	I/D/M
M. Operation of the atmospheric suspended power booster	I/D/M
N. Operation of the hydro-boost power booster	I/D/M
O. Requirements of super heavy-duty brake fluid	I
P. Conditions that are considered normal and are not indications that the master cylinder needs service	I/D/M
Q. Parts of a parking brake system on four wheel disc brakes	I
IV. Anti-lock brake system	
A. Safety precautions	I/D/M
B. Lug nut torque specifications	I/D/M
C. Description	I
D. Operation	I
E. Diagnosis and testing	I/D
F. Note on intermittents	I

G. Depressurizing the system	I/D
H. Component removal and installation	I
J. Wheel sensor air gap	I
K. Bleeding brake system	I/D/M
L. Reading wiring diagrams	I/D
M. Pin-out checks	I

Shobhit
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EDUCATION EMPOWERS

Certification Course

on

Automotive Technology Level 2

(CCME 02)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
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Automotive Technology

Level 2

Course Description

Duration: 60 Hrs.

Term: 3 Hours per day

Prerequisite: Automotive Technology Level 1

Description: This is a continuation of the Automotive Technology Level 1 course with more advanced training and more skill required in the use of tools and equipment. This course is designed to give the students the opportunity to learn practical application along with the related material in the following areas: engine rebuilding, transmissions, clutch, drive train, differentials, major tune-up, and electronic emission control systems. The students may be involved in the BMW Skill Next Program.

Course Outline

Engine Repair	Introduce Develop Master
I. Basic Engine Principles	
A. Terms related to the unit	I
B. Characteristics of energy	I
C. Types of energy	I
D. Forms of available energy	I
E. Types of motion	I
F. Simple machines	I
G. Uses of simple machines	I
H. Calculating work	I/D
I. Calculating horsepower	I/D
J. Formula for torque	I/D
K. Characteristic of heat engines	I
L. Types of heat engines	I
M. Parts of basic internal combustion engine	I/D

N. Process for converting chemical energy into rotary motion	I
O. Operation of four-stroke cycle engine	I/D/M
P. Valve timing and overlap	I/D
Q. Operation of two-stroke cycle engine	I/D
R. Formula for cubic inch displacement	I/D
S. Results of increasing compression ratio	I/D
T. Components of an automobile engine	I/D
U. Gasoline and diesel engines	I
V. Purpose of a heavy flywheel	I
II. Engine Condition Evaluation	
A. Terms related to unit	I
B. Conditions causing low oil pressure	I/D
C. Conditions that cause oil consumption	I/D
D. Items to inspect for engine condition evaluation	I/D/M
E. Items to check prior to testing for internal engine noise	I/D/M
F. Internal engine noise diagnosis	I/D/M
III. Engine Removal	
A. Terms related to unit	I
B. Safety precautions to observe while removing an engine	I/D/M
IV. Engine Disassembly	
A. Terms related to unit	I/D
B. Safety precautions to observe during engine disassembly	I/D/M
C. Factors to consider when preparing to disassemble an engine	I/D
D. Items to inspect during engine assembly	I/D/M
V. Valve Train and Cylinder Head Reconditioning	
A. Terms related to unit	I/D
B. Purpose of the valve train	I
C. Parts of the valve train	I/D
D. Function of valve train parts	I/D
E. Camshaft locations	I
F. Methods of driving the camshaft	I/D
G. Parts of the camshaft	I/D
H. Parts of the cam lobe	I/D/M
I. Types of valve lifters	I/D/M
J. Parts of a hydraulic valve lifter	I/D/M
K. Operation of a hydraulic valve lifter	I/D
L. Parts of the valve	I/D/M
M. Parts of a valve assembly	I/D/M
N. Types of valve springs and dampering devices	I/D/M

O. Types of valve stem seals	I/D/M
P. Types of valve spring keepers	I/D/M
Q. Purpose of valve spring spacer	I/D
R. Types of valve rotators	I/D
S. Purpose of valve rotator	I/D
T. Reasons a valve must seat properly	I/D/M
U. Causes of valve burning	I/D/M
V. Tools of valve reconditioning	I/D/M
VI. Engine Crankshaft, Bearings and Oil Pump	
A. Terms related to unit	I
B. Purpose of the crankshaft	I/D
C. Parts of the crankshaft	I/D
D. Methods used to manufacture crankshafts	I
E. Types of bearing used on the cam and crankshaft	I/D
F. Construction of an insert bearing	I
G. Bearing spread and crush	I/D
H. Bearing requirements	I/D
I. Causes of bearing failure	I/D/M
J. Action of lubricating oil in an insert bearing	I/D
K. Purpose of torsional vibration damper and flywheel	I
L. Types of rear main bearing oil seals	I/D
M. Types of oil pumps	I/D
N. Parts of an oil pump	I/D
O. Conditions that could lower oil pressure	I/D/M
VII. Cylinder and Piston Reconditioning	
A. Terms related to unit	I
B. Cylinder wear patterns	I/D
C. Methods of reconditioning cylinders	I/D/M
D. Types of cylinder sleeves	I
E. Reasons cylinders wear tapered	I/D
F. Parts of the cylinder block	I/D
G. Types of cylinder block core hole plugs	I/D
H. Parts of a piston and connecting rod assembly	I/D
I. Types of compression rings	I/D
J. Methods of installing compression rings	I/D/M
K. Types of oil rings	I/D
L. Methods of installing oil rings	I/D/M
M. Methods of heat and expansion control in the piston	I
N. Piston conditions and related causes	I/D/M

O. Lubrication of cylinder walls and piston pins	I/D
P. Tools and equipment used in reconditioning cylinders and pistons	I/D/M
Q. Types of piston pin locks	I/D
VIII. Engine Reassembly	
A. Terms related to unit	I
B. Tools used in engine reassembly	I/D/M
C. Reasons for torqueing bolts to specifications in an engine	I/D/M
IX. Engine Installation	
A. Terms related to unit	I
B. Safety precautions to observe during engine installation	I/D/M
C. Factors to consider when installing an engine	I/D/M
D. Items to check or adjust before starting a new or rebuilt engine	I/D/M
E. Break-in procedure	I/D/M
X. Cooling System	
A. Purpose of the cooling system	I/D
B. Terms related to unit	I
C. Types of thermostats	I/D
D. Thermostat operation	I/D/M
E. Job performed by the cooling system	I/D
F. Downflow and crossflow radiators	I
G. Methods of cooling the internal combustion engine	I/D
H. Types of radiator hoses	I/D
I. Pressure cap operation at various temperatures	I/D/M
J. Variable-speed fan drive operations	I/D/M
K. Reasons for using permanent antifreeze solution	I/D
L. Operation of the coolant recovery system	I/D
M. Belt tension	I/D/M
N. Belt inspection	I/D/M
XI. Engine Lubrication System	
A. Terms related to unit	I
B. Purpose of the engine lubrication system	I
C. Components of the engine lubrication system	I/D
D. Purposes of the components of the engine lubrication system	I/D
E. Types of oil filters	I/D
F. Engine oil classifications	I
G. Oil viscosity classifications	I
H. Oil service designation letters and their descriptions	I
I. Points to consider when selecting engine oil	I/D
J. Additives found in engine oil	I

XII. Exhaust System	
A. Purpose of the exhaust system	I
B. Terms related to unit	I
C. Types of mufflers	I
D. Operation of the manifold heat control valve	I
E. Construction and operation of catalytic converter	I
F. Tools for exhaust system service	I
G. Types of exhaust systems	I
H. Prevention of carbon monoxide poisoning	I/D
I. Causes of corrosion of exhaust system	I
J. Basic components of the exhaust gas recirculating system	I
K. Purpose of exhaust gas recirculating system	I
XIII. Fuel System	
A. Purpose of the fuel system	I
B. Terms related to unit	I
C. Components of the fuel system and their purposes	I
D. Fuel pump operation	I
E. Types of fuel filters	I
F. Types of air cleaners	I
G. Parts of the carburetor	I
H. Carburetor systems and their uses	I
I. Gasoline additives and their purposes	I
J. Fuel injection	I
K. Variations of fuel injection systems	I
Manual Drive Train	
I. Clutch Assembly	
A. Terms related to the unit	I
B. Components of the clutch assembly	I/D
C. Parts of a clutch disc	I
D. Types of pressure plates	I/D
E. Clutch operation	I/D
F. Methods used to actuate clutch release	I
G. Mechanisms that allow smooth clutch engagement	I
H. Conditions to look for during clutch inspection	I/D/M
I. Symptoms that may occur when a clutch housing bore has excessive run-out	I
J. Clutch malfunctions and probable causes	I/D/M
K. Problems not requiring clutch removal	I/D/M

L. Clutch problems requiring clutch removal	I/D/M
II. Standard Transmission	
A. Purpose of the transmission	I
B. Terms related to the unit	I
C. Parts of the transmission	I/D/M
D. Parts of a synchronizer	I/D/M
E. Types of gear teeth	I/D/M
F. Three-speed synchromesh transmission operation	I/D/M
G. Gear operation of a three-speed transmission	I/D/M
H. Basic types of overdrives	I
I. Major parts of the electrically operated overdrive	I
J. Operation of the electrically operated overdrive	I
K. Procedure for performance testing shift linkage adjustment	I/D/M
L. Procedure for performance testing the manual transmission	I/D/M
III. Drive Lines	
A. Terms related to the unit	I
B. Types of drive lines	I
C. Components of a propeller shaft	I
D. Types of U-joints	I
E. Parts of a cross and roller or cardan U-joint	I/D/M
F. Parts of a ball and trunnion U-joint	I
H. Parts of a constant velocity U-joint	I/D/M
I. Acceleration-deceleration of propeller shaft equipped with a cross and roller U-joint	I
J. Major components of a four wheel drive	I
K. Tools used in drive line repair	I
L. Methods of controlling drive line vibration	I
IV. Rear Axle	
A. Purpose of the rear axle assembly	I
B. Terms related to the unit	I
C. Parts of a gear tooth	I/D/M
D. Parts of a conventional differential	I/D/M
E. Parts of the planetary differential	I/D/M
F. Types of differential carrier housings	I/D
G. Ring gear and drive pinion tooth contact pattern	I/D/M
H. Gear tooth contact patterns	I/D/M
I. Types of rear axle shafts	I/D
J. Types of rear axle bearings	I/D
V. Automatic Transmission Service	
A. Terms related to the unit	I

B. Repairs which can be performed with the transmission in the vehicle	I
C. Items to include in a automatic transmission tune-up	I
D. Tests that are performed while transmission is in the vehicle	I/D
E. Types of automatic transmission fluids and their applications	I/D/M
F. Procedure for properly checking transmission fluid level	I/D/M
G. Fluid conditions and possible transmission problems	I/D
H. Types of transmission filters	I
VI. Manual Transaxle Operation	
A. Terms related to the unit	I
B. Transaxle components and how they function	I/D/M
C. Transaxle operation	I/D
VII. Manual Transaxle Diagnosis	
A. The operation and design	I/D/M
B. Half shaft diagnosis	I/D/M
VIII. Transaxle Removal and Disassembly	
A. Safety in transaxle removal	I/D/M
B. Procedure for removing the transaxle	I/D
C. Transaxle disassembly	I/D/M
IX. Transaxle Cleaning, Inspection and Assembly	
A. Procedure for cleaning and inspecting transaxle components	I/D/M
B. Clutch inspection	I/D/M
C. Procedure for reassembling and adjusting the transaxle	I/D/M
D. Half shaft repair procedures	I/D/M
X. Transaxle Installation and Performance Testing	
A. Transaxle installation	I/D
B. Procedures for performance testing the transaxle	I/D
XI. Four-Wheel-Drive Components and Operation	
A. Terms related to the unit	I
B. Four-wheel-drive components and functions	I
C. Driveline operation	I
XII. Four-Wheel-Drive Diagnosis and Repair	
A. Safety in four-wheel-drive diagnosis and repair	I/D/M
B. Procedures for diagnosing a four-wheel-drive vehicle	I
C. Repair procedures for locking hubs	I
D. Procedure for removing the front differential assembly	I
E. Repair procedures for front spindals	I
XIII. Transfer Case Components and How They Function	
A. Transfer case components and their functions	I
B. Transfer case operation	I

XIV. Transfer Case Diagnosis and Removal	
A. Transfer case diagnosis	I
B. Safety in transfer case removal	I/D/M
C. Procedures for removing the transfer case	I
XV. Transfer Case Disassembly, Cleaning, Adjustment and Reassembly	
A. Procedure for disassembly of the transfer case	I
B. Procedure for cleaning and inspecting the transfer case	I
C. Transfer case end-play and torque measurements	I
D. Procedure for reassembly of the transfer case	I
XVI. Transfer Case Installation and Performance Testing	
A. Transfer case installation	I
B. Procedure for performance testing and transfer case	I

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EDUCATION EMPOWERS

Certification Course

on

Biomechatronics (CCBM 01)

Offered by

School of Biomedical Engineering

Shobhit Institute of Engineering and Technology

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Bio-Mechatronics

About Bio-Mechatronics:

Bio-Mechatronics is an applied interdisciplinary science that aims to integrate biology and mechatronics (electrical, electronics and mechanical engineering).

It also encompasses the fields of robotics and neuroscience. Biomechatronic devices encompass a wide range of applications from the development of prosthetic limbs to engineering solutions concerning respiration, vision, and the cardiovascular system.

Bio-Mechatronics is the integration of biological components with artificial devices, in which the biological component confers a significant functional capability to the system, and the artificial component provides specific cellular and tissue interfaces that promote the maintenance and functional adaptation of the biological component. Based upon functional performance, muscle is potentially an excellent mechanical actuator, but the larger challenge of developing muscle-actuated, biomechatronic devices poses many scientific and engineering challenges.

Course Duration: 30 Hrs.

Detailed Syllabus

Pre-requisites: Knowledge of Materials and their properties used in Manufacturing process Basic Knowledge of Electrical, Electronics, Mechanics and Biology.

Course Outcomes: At the end of the course, the student will be able to:

CO1	Explain the motivation, ethical issues and future challenges in bio-mechatronics.
CO2	Analyze the design and construction of biomechatronic technologies.
CO3	Evaluate the design and construction of biomechatronic technologies.
CO4	Apply appropriate dynamic models and computational tools to simulate and analyze biomechatronic systems.
CO5	Design simple biomechatronic systems using appropriate hardware instrumentation and end user.

Course Contents

Module 1 Introduction to Bio-mechatronics: clinical examples, highlights of technology, ethical issues and course outline. Nervous and muscular systems: the nervous system as a controller, sensory systems of the body, neurons and action potentials, muscles as actuators.

Module 2 Mechanics and materials: the body in motion, mechanical properties of tissues, mechanical analysis of body parts and their motion, materials and their properties for biomechatronic engineering.

Module 3 Electrodes: applications of electrodes, recording and stimulation of bioelectronic signals, electrode-tissue interface.

Module 4 Sensors, power sources and control: covering a range of sensors, power sources and control strategies used in bio-mechatronics. Prosthetic electronic skins.

Module 5 Bioprinting: 3D printing technologies in biomedicine, Signals: signal acquisition, processing and analysis. Filters, ADC and amplification of bioelectronic signals.

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Certification Course

on

Cyber Security (CCCS 04)

Offered by

School of Computer Science and Engineering

Shobhit Institute of Engineering and Technology
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Why take up this course?

- To gain the ability to define the design, architecture, and management of an organization's security
- To perform data loss prevention and risk analysis
- To acquire an understanding of the security architecture, models, engineering, and cryptography
- To get familiar with network security and communications, identity and access management, operations, and security testing

Career Prospects of this course

- IT Directors
- IT Security Consultants
- Security Auditors
- IT Managers
- Security Analysts
- Directors of Security
- Security Managers
- Network Architects
- Security Systems Engineers
- Security Architects
- Chief Information Security Officers

Program Curriculum

Cyber Security Training Course Content

1. **SECURITY AND RISK MANAGEMENT**
    - Regulatory and legal issues
    - Confidentiality, availability, and integrity concepts
    - Principles of security governance
    - Compliance and professional ethics
    - Requirements of business continuity
    - Policies of personnel security
    - Threat modeling and risk considerations
    - Security education, awareness, and training
    - Security policies, standards, procedures, and guidelines
2. **ASSET SECURITY**
    - Privacy protection
    - Asset and information classification
    - Ownership
    - Data security controls and appropriate retention
    - Requirements handling
3. **SECURITY ARCHITECTURE AND ENGINEERING**
    - Security evaluation models
    - Fundamental concepts of security models
    - Security designs, architectures, and solution elements vulnerabilities

- Information systems security capabilities
- Using secure design principles for engineering processes
- Vulnerabilities of web-based and mobile systems
- Cryptography
- Vulnerabilities of cyber-physical systems and embedded devices
- Secure principles of facility and site design
- Physical security

4. COMMUNICATION AND NETWORK SECURITY

- Architectural design of a secure network
- Channels for secure communication
- Components of a secure network
- Network attacks

5. IDENTITY AND ACCESS MANAGEMENT (IAM)

- Logical/physical access to assets management
- Authentication and identification management
- Integrating identity as a third-party service
- Mechanism of authorization
- Provisioning life cycle's identity and access

6. SECURITY ASSESSMENT AND TESTING

- Test outputs (e.g., manual and automated)
- Security process data (e.g., operational and management controls)
- Vulnerabilities of security architectures
- Testing of security control
- Test and assessment strategies

7. SECURITY OPERATIONS

- Monitoring and logging activities
- Investigation requirements and support
- Incident management
- Resource provision
- Concepts of foundational security operations
- Recovery strategies
- Techniques of resource protection
- Physical security
- Measures of prevention
- Vulnerability and patch management
- Processes of change management
- Exercises and planning of business continuity
- Personnel safety concerns
- Plans and processes for disaster recovery

8. SOFTWARE DEVELOPMENT SECURITY

- Security controls for development environment
- Software development life cycle security
- Impact of acquired software security
- Effectiveness of software security

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Certification Course

on

Digital Marketing (CCBS 02)

Offered by

School of Business Studies

Shobhit Institute of Engineering and Technology

(Deemed to be University)

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Digital Marketing

Overview:
In simple terms, digital marketing is the promotion of products or brands via one or more forms of electronic media. Digital marketing is often referred to as online marketing, internet marketing or web marketing.

Duration: 40 Hrs.

Course Objectives:

Digital marketing objectives should be SMART (Specific, Measurable, Achievable, Relevant and Time Related); and you should benchmark against your competitors to ensure that you are more effective.

Pre-requisite / Target Audience:

- No prior knowledge about marketing or digital marketing is required
- Speak and write English fluently
- Have broadband internet access
- Have basic PC skills and online access
- Be over the age of 18
- Be fully committed to Squared!

Module 1: Introduction to Digital Marketing:

In this module you will learn what is digital marketing, and importance of digital marketing. And you will also learn what is web site and levels of web site, Difference between blog, portal & website.

- What is digital marketing?
- How is it different from traditional marketing?
- ROI between Digital and traditional marketing?
- Discussion on Ecommerce
- Discussion on new trends and current scenario of the world?
- Digital marketing a boon or a Bane?
- How can digital marketing be a tool of success for companies?
- Video on importance of digital marketing
- Analysis of recent info graphics released by companies about digital marketing?
- How did digital marketing help the small companies and top inc
- Categorization of digital marketing for the business
- Diagnosis of the present website and business.

- Swot analysis of business, present website and media or promotion plan.
- Setting up vision,mission,and goals of digital marketing

Understanding a website

- What is a website?
- Levels of websites?
- Diff b/w Blog, Portal and Website?
- Diff b/w websites either static or dynamic

Module 2: Search Engine Optimization (SEO):

In this module you will learn complete about SEO (Search engine Optimization, what is On page optimization, Off page optimization, and you also learn how to prepare a reports like- Keywords, titles, meta tags etc..

- On page optimization techniques
- Off page Optimization techniques
- Reports

Module 3: Social Media Optimization (SMO):

In this module you will learn how to do SMO (Social Media Optimization) like Facebook, Twitter, LinkedIn, Tumblur, Pinterest and more social media services optimization.

- Introduction to social Media Marketing
- Advanced Facebook Marketing
- Word Press blog creation
- Twitter marketing
- LinkedIn Marketing
- Google plus marketing
- Social Media Analytical Tools

Module 4: Search Engine Marketing:

In this module you will learn what SME (Search Engine Marketing) is a paid tool like Google Adwords, now a days we have so many paid tools we discuss is briefly and display advertising techniques and all.

- Introduction to Search Engine Marketing
- Tools used for Search engine Marketing
- PPC /Google Adwords Tool
- Display advertising techniques
- Report generation

Module 5: Additional Module:

In this module you will learn about tools for more useful to SEO, these tool used for analysis on website traffic, keyword analysis and also you can learn Email marketing and all.

- Google Analytics
- Online Reputation Management
- E-Mail Marketing
- Affiliate Marketing
- Social Media Analytics
- Ad designing

At the end of the course participants will be able to

1. Online & Offline SEO
2. Competitive Analysis For Smarter Marketing
3. You will learn how to use dozens of proven digital marketing strategies
4. You will learn how to use all of the most popular social media platforms to grow your business
5. You will see tangible results by taking action throughout the entire course
6. You will increase conversions and sales with real world techniques
7. You will improve your brand identity and grow your brand's audience

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Certification Course

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Ethical Hacking (CCCS 03)

Offered by

School of Computer Science and Engineering

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Who is a Certi ied Ethical Hacker?

A Certified Ethical Hacker is a specialist typically working in a red team environment, focused on attacking computer systems and gaining access to networks, applications, databases, and other critical data on secured systems. A CEH understands attack strategies, the use of creative attack vectors, and mimics the skills and creativity of malicious hackers. Unlike malicious hackers and actors, Certified Ethical Hackers operate with permission from the system owners and take all precautions to ensure the outcomes remain confidential. Bug bounty researchers are expert ethical hackers who use their attack skills to uncover vulnerabilities in the systems.

Course Description

The Certified Ethical Hacker (CEH) credential is the most trusted ethical hacking certification and accomplishment recommended by employers globally. It is the most desired information security certification and represents one of the fastest-growing cyber credentials required by critical infrastructure and essential service providers. Since the introduction of CEH in 2003, it is recognized as a standard within the information security community. CEH v11 continues to introduce the latest hacking techniques and the most advanced hacking tools and exploits used by hackers and information security professionals today. The Five Phases of Ethical Hacking and the original core mission of CEH remain valid and relevant today: "To beat a hacker, you need to think like a hacker."

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Certi ied Ethical Hacker (CEH) Version 11

CEH provides an in-depth understanding of ethical hacking phases, various attack vectors, and preventative countermeasures. It will teach you how hackers think and act maliciously so that you will be better positioned to set up your security infrastructure and defend future attacks. Understanding system weaknesses and vulnerabilities help organizations strengthen their system security controls to minimize the risk of an incident.

CEH was built to incorporate a hands-on environment and systematic process across every ethical hacking domain and methodology, giving you the opportunity to work towards proving the required knowledge and skills needed to perform the job of an ethical hacker. You will be exposed to an entirely different posture towards the responsibilities and measures required to be secure.

In its 11th version, CEH continues to evolve with the latest operating systems, tools, tactics, exploits, and technologies. Here are some critical updates of CEH v11:

Incorporating Parrot Security OS

When compared to Kali Linux, Parrot Security OS offers better performance on lower-powered laptops and machines while offering an intuitive look and feel with a larger repository of general tools.

Re-Mapped to NIST/NICE Framework

CEH v11 is mapped rigorously to important Specialty Areas under the NIST/NICE framework's Protect and Defend (PR) job role category overlapping with other job roles, including Analyze (AN) and Securely Provision (SP).

Enhanced Cloud Security, IoT, and OT Modules

CEH v11 covers updated Cloud and IoT modules to incorporate CSP's Container Technologies (e.g., Docker, Kubernetes), Cloud Computing threats, and a number of IoT hacking tools (e.g. Shikra, Bus Pirate, Facedancer21, and more). This is critical as the world moves towards broader and deeper cloud adoptions.

Cloud-Based Threats

As the cloud industry is estimated to reach $354 billion by 2022, the businesses struggle to limit the frequency of data theft incidents due to misconfigured cloud environments. January to April 2020 alone saw a 630% spike in cloud-based attacks. Learn how to avoid, identify, and respond to cloud-based attacks with CEH v11.

IoT Threats

Market reports anticipate that the worldwide IoT-connected devices are expected to reach 43 billion by 2023. To support this rapid expansion, the prominent players of the internet, including Amazon Web Services, Google, IBM, Microsoft, are swiftly shifting to private cloud services, creating complexities in IoT ecosystems. Learn to deal with IoT-based attacks with the CEH v11 course that covers the latest IoT hacking tools, such as Shikra, Bus Pirate, Facedancer21, and many others.

Operational Technology (OT) Attacks

Last year, businesses experienced a 2,000% increase in OT based incidents. You can gain expertise in OT, IT, and IIoT (industrial IoT) to secure a critical enterprise OT/IoT deployments. To learn the advanced skills of OT, CEH covers concepts of OT, such as ICS, SCADA, and PLC, various challenges of OT, OT hacking methodology, tools, communication protocols of an OT network like Modbus, Profinet, HART-IP, SOAP, CANopen, DeviceNet, Zigbee, Profibus, etc., and gaining Remote Access using DNP3 protocol.

Modern Malware Analysis

CEH v11 now includes the latest malware analysis tactics for ransomware, banking and financial malware, IoT botnets, OT malware analysis, Android malware, and more!

Covering the Latest Threats - Fileless Malware

As the security community observed a rise in fileless attacks, it began to raise concerns about fileless malware attacks. As fileless malware is a relatively new form of malware attack, organizations find it difficult to detect with endpoint security solutions. With the CEH v11, you can now learn various fileless malware techniques with associated defensive strategies, as the course focuses on the taxonomy of fileless malware threats, fileless malware obfuscation techniques to bypass antivirus, launching fileless malware through script-based injection, launching fileless malware through phishing, and more.

New Lab Designs and Operating Systems

This latest iteration of CEH v11 includes new operating systems, including Windows Server 2019, Windows Server 2016, and Windows 10 configured with Domain Controller, firewalls, and vulnerable web applications for practicing and improving hacking skills.

Increased Lab Time and Hands-on Focus

More than 50% of the CEH v11 course is dedicated to practical skills in live ranges via EC-Council labs. EC-Council leads in this aspect of the industry.

Industry's Most Comprehensive Tools Library

The CEH v11 course includes a library of the latest tools required by security practitioners and pen testers across the world.

Course Outline

Module 01	Introduction to Ethical Hacking
Module 02	Footprinting and Reconnaissance
Module 03	Scanning Networks
Module 04	Enumeration
Module 05	Vulnerability Analysis
Module 06	System Hacking
Module 07	Malware Threats
Module 08	Sniffing
Module 09	Social Engineering
Module 10	Denial-of-Service
Module 11	Session Hijacking
Module 12	Evading IDS, Firewalls, and Honeypots
Module 13	Hacking Web Servers
Module 14	Hacking Web Applications
Module 15	SQL Injection
Module 16	Hacking Wireless Networks
Module 17	Hacking Mobile Platforms
Module 18	IoT and OT Hacking
Module 19	Cloud Computing
Module 20	Cryptography

What You Will Learn ?

- Key issues include plaguing the information security world, ethical hacking, information security controls, laws, and standards.
- Perform footprinting and reconnaissance using the latest footprinting techniques and tools as a critical pre-attack phase required in ethical hacking.
- Network scanning techniques and scanning countermeasures.
- Enumeration techniques and enumeration countermeasures.
- Vulnerability analysis to identify security loopholes in the target organization's network, communication infrastructure, and end systems.
- System hacking methodology, steganography, steganalysis attacks, and covering tracks to discover system and network vulnerabilities.
- Different types of malware (Trojan, Virus, worms, etc.), system auditing for malware attacks, malware analysis, and countermeasures.
- Packet sniffing techniques to discover network vulnerabilities and countermeasures to defend sniffing.
- Social engineering techniques and how to identify theft attacks to audit human-level vulnerabilities and suggest social engineering countermeasures.
- DoS/DDoS attack techniques and tools to audit a target and DoS/DDoS countermeasures.
- Session hijacking techniques to discover network-level session management, authentication/authorization, cryptographic weaknesses, and countermeasures.
- Web server attacks and a comprehensive attack methodology to audit vulnerabilities in web server infrastructure, and countermeasures.
- Web application attacks and comprehensive web application hacking methodology to audit vulnerabilities in web applications, and countermeasures.
- SQL injection attack techniques, injection detection tools to detect SQL injection attempts, and countermeasures.
- Wireless encryption, wireless hacking methodology, wireless hacking tools, and Wi-Fi security tools.
- Mobile platform attack vector, android vulnerability exploitations, and mobile security guidelines and tools.
- Firewall, IDS and honeypot evasion techniques, evasion tools and techniques to audit a network perimeter for weaknesses, and countermeasures.
- Cloud computing concepts (Container technology, serverless computing), various threats/attacks, and security techniques and tools.
- Penetration testing, security audit, vulnerability assessment, and penetration testing roadmap.
- Threats to IoT and OT platforms and learn how to defend IoT and OT devices securely.
- Cryptography ciphers, Public Key Infrastructure (PKI), cryptography attacks, and cryptanalysis tools.

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Target Audience

- Information Security Analyst / Administrator
- Information Assurance (IA) Security Officer
- Information Security Manager / Specialist
- Information Systems Security Engineer / Manager
- Information Security Professionals / Officers
- Information Security / IT Auditors
- Risk / Threat/Vulnerability Analyst
- System Administrators
- Network Administrators and Engineers

Suggested Course Duration

Minimum Hours: 40

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Certification Course

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Internet of Things (CCCS 02)

Offered by

School of Computer Science and Engineering

Shobhit Institute of Engineering and Technology

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Certificate Course in Internet of Things (IOT) Using Arduino

Objective of the Course:

This Course focuses on hands-on IoT concepts such as sensing, actuation and communication. It covers the development of Internet of Things (IoT) prototypes—including devices for sensing, actuation, processing, and communication—to help you develop skills and experiences. The Internet of Things (IOT) is the next wave, world is going to witness. Today we live in an era of connected devices the future is of connected things.

Learning Outcome:

After the completion of the course, the students will be able design some IOT based prototypes

Duration of the Course: 60 Hrs.

Minimum Eligibility Criteria:

Pursuing/Passed BE/B.Tech/BCA/BSc.

COURSE OUTLINE

Sr. No.	Modules to be Covered
1	Introduction to IOT
2	Simulation Environment
3	Sensor & Actuators with Raspberry Pi
4	Basic Networking with Wi-Fi module
5	IoT Protocols
6	Cloud Platforms for IOT

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Contents to be covered

Module 1

Introduction to IoT: Architectural Overview, Design Principles and needed capabilities, IoT Applications, Sensing, Actuation, Basics of Networking, M2M and IoT technology Fundamentals, Devices and Gateways, Data management, Business Processes in IoT, Everything as a Service (XaaS), Role of cloud in IoT, Security aspects in IoT

Module 2

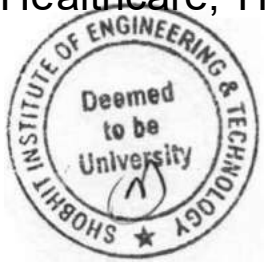
Elements of IoT: Hardware components- Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, i/O Interfaces, Software Components-Programming API's (using Python/Node js/Arduino) for Communication Protocols-MQTT, Zigbee, Bluetooth, CoAP, UDP, TCP.

Module 3

IoT Application Development: Solution framework for IoT Applications, Implementation of device integration, Data acquisition and integration, Device data storage-Unstructured data storage on cloud/local server, Authentication, Authorization of devices.

Module 4

IoT case Studies: IoT Case studies and mini projects based on Industrial automation, Transportation, Agriculture, Healthcare, Home automation



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EDUCATION EMPOWERS

Certification Course

on

Intellectual Property Rights

(CCLW 01)

Offered by

School of Law and Constitutional Studies

Shobhit Institute of Engineering and Technology

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Background

Indian Law Institute (ILI) has been the pioneer in the field of teaching and training of intellectual property laws and cyber laws. After having established a sound framework for the classroom teaching in these fields, we now plan to traverse the virtual world to embark on e-education.

By e-education is meant an innovative, on-line teaching technique for distance learning that utilizes the Internet for teaching purposes. E-education would bring teachers specializing in intellectual property issues closer to students in all corners of India through virtual means. This method allows students to undertake the ILI educational programs in intellectual property at their own place anywhere in India.

The Institute would use distance learning as an alternative and a complement to traditional training methods in order to make course materials accessible to large audiences throughout India.

About the course

Development of IPR is a recent phenomenon. It is still in a nascent stage and continuously evolving every passing day. Even the most learned legal luminaries find it difficult to solve the legal problems posed by technology. The Online Certificate Course offered by the institute, intends to spread awareness among the general public about the IPR, it is specifically beneficial to the lawyer community and the judges in the subordinate judiciary, who face cases on the daily basis.

The course is designed to give distant education wherein the students need not come to the institute for either classes or examination. The course will be conducted online and the subscribers need to operate from their respective places. All the queries of the subscribers relating to the admission or the conduct will be answered online.

Teaching procedure

The Institute's initiative takes full advantage of information technology and the Internet as an alternative and a complement to traditional training programs. It offers new teaching methodologies, specially-designed course materials, evaluation tools, tailored means of delivery, and greater accessibility.

Teaching would take place in the virtual environment of the Institute's Web site. A network of tutors on the panel of ILI will be available to guide the students. Students and teachers can interact as often as necessary during the course, because communication takes place through e-mail.

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At the end of the program, successful students receive a certificate acknowledging completion of the course.

Things that would take place on-line in the course:

- Registration
- Student-teacher interaction
- Student tests and assignments
- Course monitoring
- Evaluation

Who can pursue?

It is a general course which would be of immense value to persons who fall in the following categories:

- Students
- Lawyers
- Law enforcement personnel - customs officials, police officials, etc.
- Patent agents
- Intellectual Property Offices in Government Sector
- Engineers
- Scientists
- Software Professionals
- Company Executives
- Economists
- Journalists
- Government Officials

Syllabus

The syllabus is divided in four components:

- Patents
- Copyright and neighbouring rights
- Trademarks, Geographical Indications and Domain Names
- Management of Intellectual Property Rights

Duration

40 Hrs.

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Detailed Syllabus

Objectives:

- To introduce fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.
- To disseminate knowledge on patents, patent regime in India and abroad and registration aspects
- To disseminate knowledge on copyrights and its related rights and registration aspects
- To disseminate knowledge on trademarks and registration aspects
- To disseminate knowledge on Design, Geographical Indication (GI), Plant Variety and Layout Design Protection and their registration aspects
- To aware about current trends in IPR and Govt. steps in fostering IPR

Unit 1	Intellectual Property Rights: An overview	
Introduction and the need for intellectual property right (IPR) - Kinds of Intellectual Property Rights: Patent, Copyright, Trade Mark, Design, Geographical Indication, Plant Varieties and Layout Design – Genetic Resources and Traditional Knowledge – Trade Secret - IPR in India : Genesis and development – IPR in abroad - Major International Instruments concerning Intellectual Property Rights: Paris Convention, 1883, the Berne Convention, 1886, the Universal Copyright Convention, 1952, the WIPO Convention, 1967,the Patent Co-operation Treaty, 1970, the TRIPS Agreement, 1994		
Unit 2	**Patents**	
Patents - Elements of Patentability: Novelty, Non-Obviousness (Inventive Steps), Industrial Application - Non - Patentable Subject Matter - Registration Procedure, Rights and Duties of Patentee, Assignment and licence, Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties, Patent office and Appellate Board		

Unit 3	Copyrights	
Nature of Copyright - Subject matter of copyright: original literary, dramatic, musical, artistic works; cinematograph films and sound recordings - Registration Procedure, Term of protection, Ownership of copyright, Assignment and licence of copyright - Infringement, Remedies & Penalties – Related Rights - Distinction between related rights and copyrights		
Unit 4	**Trademarks**	
Concept of Trademarks - Different kinds of marks (brand names, logos, signatures, symbols, well known marks, certification marks and service marks) - Non-Registrable Trademarks - Registration of Trademarks - Rights of holder and assignment and licensing of marks - Infringement, Remedies & Penalties - Trademarks registry and appellate board		
Unit 5	**Other types of IP**	
Design Design: meaning and concept of novel and original - Procedure for registration, effect of registration and term of protection **Geographical Indication (GI)** Geographical indication: meaning, and difference between GI and trademarks - Procedure for registration, effect of registration and term of protection **Plant Variety Protection** Plant variety protection: meaning and benefit sharing and farmers' rights – Procedure for registration, effect of registration and term of protection **Layout Design Protection** Layout Design protection: meaning – Procedure for registration, effect of registration and term of protection		
Unit 6	**Current Regime & Scenario**	
India`s New National IP Policy, 2016 – Govt. of India step towards promoting IPR – Govt. Schemes in IPR – Career Opportunities in IP - IPR in current scenario with case studies		

Course Outcomes:

- The students once they complete their academic projects, shall get an adequate knowledge on patent and copyright for their innovative research works
- During their research career, information in patent documents provide useful insight on novelty of their idea from state-of-the art search. This provides further way for developing their idea or innovations
- Pave the way for the students to catch up Intellectual Property (IP) as a career option
    a. R&D IP Counsel
    b. Government Jobs – Patent Examiner
    c. Private Jobs
    d. Patent agent and Trademark agent
    e. Entrepreneur

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EDUCATION EMPOWERS

Certification Course

on

Linux Fundamentals

(CCCS 01)

Offered by

School of Computer Science and Engineering

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Linux Course Curriculum

Introduction to Linux

Learning Objective: In this module, you will be introduced to various features of Linux. You will learn history, open source licences, various Linux distributions and Linux installation

Topics:

- Need for Linux OS
- What is Linux
- History of Linux
- Relationship Between Unix And Linux
- Features of Linux
- False myths around Linux
- Where Linux is used?
- Components of a Linux OS
- The architecture of Linux OS
- Types of Kernel
- Shell
- Programming in Linux
- Linux Distribution
- Miscellaneous Linux Concepts
- Software Licencing
- Installation and initialisation of Linux
- Shell Scripting
- Practical Uses of Shell Scripting

Initialization of Linux

Learning Objective: In this module, you will understand the user interface, commands and tools, and file operations in Linux

Topics:

- Understand User Interface in Linux
- Implement basic Linux Commands and Tools
- vim Editor
- Advanced Linux Commands
- File System
- File System Comparisons
- File Attributes
- File Operations
- File System Characteristics
- File Access Methods
- Formatting and Partitioning
- Multiboot System
- Learn Packaging Management in Linux

Hands On/Demo:

- Linux Commands
- Vim Editor
- Creating partitions

User Administration

Learning Objective: In this module, you will learn about managing Users and perform Authentication

Configuration

Topics:

- Users in Linux
- User Configuration
- Adding/Deleting/Modifying Users
- Group Administration
- Password Aging Policies
- Switching Accounts
- Sudo
- Network Users
- Authentication Configuration
- SUID and SGID Executable
- SGID Directories
- The Sticky Bit
- Default File Permissions
- Access Control Lists (ACLs)
- Hidden Files

Hands On/Demo:

- Demo – sudo, chown and chmod
- Adding a user
- Delete user
- Modify user
- Hidden Files

Boot and Package Management

Learning Objective: In this module, you will learn about the boot management system and configuring services to run at boot. You will understand package management, which includes installing and removing software and updating a Kernel RPM.

Topics:

- Kernel Configuration
- Boot Management
- Grub Bootloader Configurations
- Red Hat Package Manager
- YUM
- DPKG
- APT
- Build from the source code
- Libraries

Hands On/Demo:

- Sysctl
- Bootloader Configurations
- Red Hat Package Manager
- YUM
- DPKG
- APT

Networking

Learning Objective: In this module, you will learn about OSI layers and various protocols of networking in Linux

Topics:

- OSI layers and Protocols: IPv4, IPv6, TCP, UDP, FTP, TFTP, Telnet, SSH, HTTP, DNS, DHCP, ARP, ICMP etc.
- Packet capturing tools
- Linux commands/tools to troubleshoot networking: netstat, tcpdump, ip, etc.
- Linux utilities: e.g. dnsmasqd, samba server ftpd, webserver, netcat, scp etc.
- Linux Firewall: command, utility and usage.
- Security: SSH, SCP. Certificates, authentication, encryption etc.
- Remote log in: SSH, screen, VNC, etc.

Hands On/Demo:

- IP addresses
- DNS
- ICMP
- dnsmasq.conf
- IP tables

Linux Overview and Scripting

Learning Objective: In this module, you will learn process management, system calls and bash operations

Topics:

- Process Management
- Process Commands
- System Calls
- Output Redirection
- Special Variables in Bash
- Expect Script

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- Python Scripting
- Dictionaries

Hands On/Demo:

- Ps command
- Top command
- Kill command
- Expect

Linux for software development

Learning Objective: In this module, you will learn about programming languages, libraries and profiling tools

Topics:

- Programming languages overview
- Static and Shared libraries
- Compilers, debugger, IDE, ctags, make utility etc.
- Editors in Linux: vi, emacs,
- Troubleshooting and optimization using profiling tools
- Diff, patch and Configuration management system
- Test automation and CI/CD pipeline

Hands On/Demo:

- Libraries
- Makefile

Security Administration, Shell Script and Virtualization

Learning Objective: In this module, we will learn about Linux security administration and Virtualization

Topics:

- Security in IT Industry
- SELinux
- Information gathering tools
- Grub security
- TCP Wrappers
- Securing Shell
- ClamAV
- Virtualization

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EDUCATION EMPOWERS

Certification Course

on

MATLAB from beginner to advance level (CCEC 02)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

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Basic Course Description

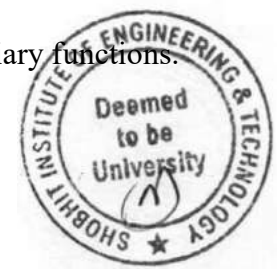
MATLAB (matrix laboratory) is one of the fundamental and leading programming languages and is a must learn skill for anyone who want to develop a career in engineering, science or related fields. Excellent **MATLAB programming skills** is therefore a crucial factor in making or breaking your career.

Duration: 40 Hrs.

This MATLAB course is one of the **most comprehensive MATLAB** courses which will take from **beginner to professional**. This course is designed from a perspective of a student who has **no prior knowledge of MATLAB and who is a MATLAB beginner.**

Throughout this comprehensive course, we cover a massive number of skills and techniques including:

- Basic mathematics and matrix manipulation functions
- Data import and visualization
- MATLAB Programming, problem solving, logic development and the use of customized functions
- Symbolic functions and variables for advance math operations
- File and directory handling
- Live scripts and sharing of results
- Advance data types including cells, tables, time tables and map containers
- Data science classification, clustering and dimensionality reduction with MATLAB
- Essential data preprocessing tasks such as outliers, missing values, categorical attributes handling
- Building regular expressions for textual processing
- Building GUIs using Guide and AppDesigner.
- Automating tasks by controlling mouse, keyboard, running scripts from command window, batch files
- Web, email and other internet related operations
- Generating ppts, word files and pdfs
- Code debugger and analyzer, exception handling, startup, finish and diary functions.



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What you'll learn

- Develop beginner to advance level skills of Programming with MATLAB. This is the only course which enables you to learn intermediate and advance programming data structures such as structures, tables, times tables, cells and map container.
- Gain Hands-On experience with MATLAB for visualizing, analyzing and formulating intermediate and some advanced level problems using MATLAB programming skills
- Experience some real-world applications of MATLAB in solving Data Science problems.

Requirements

- We cover everything from scratch and therefore do not require any prior knowledge of MATLAB
- The installation of MATLAB software on your machine is a must for this course so that you are able to run the commands and scripts that we cover during the course. If you do not have the MATLAB software installed than you may consider the following options
- 1. You may download a free trail copy of the software from the MATHWORK website. This is for limited time use
- 2. If you are student or employee, you may contact your School or employer for a free copy. Many universities offer a free student version of the software
- 3. You may consider downloading the Octave which is a free and has nearly identical functionality as that of MATLAB. (I would not recommend this option since you may not be able to have access to all the functions that we cover in this course)
- 4. If none of the above works for you, then you may purchase the student version directly from MathWorks website which is significantly lower in cost compare to its full version.

Basic Course Description

MATLAB (matrix laboratory) is one of the fundamental and leading programming language and is a must learn skill for anyone who want to develop a career in engineering, science or related fields. Excellent **MATLAB programming skills** is therefore a crucial factor in making or breaking your career.

This course is designed from a perspective of a student who has **no prior knowledge of MATLAB.** The course starts from the very basic concepts and then built on top of those basic concepts and move towards more advanced topics such as **visualization**, exporting and importing of data, **advance data types** and **data structures** and advance programming constructs.

To get the real feel of MATLAB in solving and analyzing real life problems, the course includes **machine learning topics in data science and data preprocessing.**

The course is fun and exciting, but at the same time we dive deep into MATLAB to uncover its power of formulating and analyzing real life problems. The course is structured into four different Parts. Below is the detailed outline of this course.

Part 1: MATLAB from Beginner to Advance

Segment 1.1: Handling variables and Creating Scripts

Segment 1.2: Doing Basic Mathematics in MATLAB

Segment 1.3: Operations on Matrices

Segment 1.4: Advance Math Functions with Symbolic Data Type

Segment 1.5: Interacting with MATLAB and Graphics

Segment 1.6: Importing Data into MATLAB

Segment 1.7: File Handling and Text Processing

Segment 1.8: MATLAB Programming

Segment 1.9: Sharing Your MATLAB Results

Part 2: Advance MATLAB Data Types

Segment 2.1: Cell Data Type

Segment 2.2: Tables and Time Tables

Segment 2.3: Working with Structures and Map Container Data Type

Segment 2.4: Converting between Different Data Types

Part 3: Machine Learning for Data Science Using MATLAB

Segment 3.1 Data Preprocessing

Segment 3.2. Classification

Segment 3.2.1 K-Nearest Neighbor

Segment 3.2.2 Naive Bayes

Segment 3.2.3 Decision Trees

Segment 3.2.4 Support Vector Machine

Segment 3.2.5 Discriminant Analysis

Segment 3.2.6 Ensembles

Segment 3.2.7 Performance Evaluation

Segment 3.3 Clustering

Segment 3.3.1 K-Means

Segment 3.3.2 Hierarchical Clustering

Segment 3.4 Dimensionality Reduction

Segment 3.5 Project

Part 4: Data Preprocessing for Machine Learning using MATLAB

Segment 4.1 Handing Missing Values

Segment 4.2 Dealing with Categorical Variables

Segment 4.3 Outlier Detection

Segment 4.4 Feature Scaling and Data Discretization

Segment 4.5 Selecting the Right Method for your Data

Who this course is for:

- Anyone looking to build a strong career in science or engineering through Excellent MATLAB coding skills
- Anyone wanting to advance their skills of real-world problem solving with MATLAB based scientific computing

By taking this course, you will become a **fluent** MATLAB programmer and you'll be so good so that you can get a reasonable job offer as a MATLAB developer and use the language professionally.

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Certification Course

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Personality Development and Soft Skills (CCBS 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

Personality Development and Soft Skills

INTENDED AUDIENCE : Students, Teachers, Professionals, Trainers, Leaders, Employers

DURATION: 40 Hrs.

INDUSTRIES APPLICABLE TO: All industries/companies/organizations will recognize and value this course and recommend this for their employees and trainee programs.

COURSE OUTLINE :

The course aims to cause a basic awareness about the significance of soft skills in professional and inter-personal communications and facilitate an all-round development of personality. Hard or technical skills help securing a basic position in one's life and career. But only soft skills can ensure a person retain it, climb further, reach a pinnacle, achieve excellence, and derive fulfilment and supreme joy. Soft skills comprise pleasant and appealing personality traits as self-confidence, positive attitude, emotional intelligence, social grace, flexibility, friendliness and effective communication skills.

COURSE PLAN :

Week 01 : Introduction: A New Approach To Learning, Planning And Goal-Setting, Human Perceptions: Understanding People, Types of Soft Skills: Self-Management Skills, Aiming For Excellence: Developing Potential And Self-Actualisation, Need Achievement And Spiritual Intelligence.

Week 02 : Conflict Resolution Skills: Seeking Win-Win Solution, Inter-Personal Conflicts: Two Examples, Two Solutions, Types of Conflicts: Becoming A Conflict Resolution Expert, Types of Stress: Self-Awareness About Stress, Regulating Stress: Making The Best out of Stress.

Week 03 : Habits: Guiding Principles, Identifying Good And Bad Habits, Habit Cycle; Breaking Bad Habits, Using The Zeigarnik Effect For Productivity And Personal Growth, Forming Habits of Success.

Week 04 : Communication: Significance Of Listening, Active Listening, Barriers To Active Listening; Telephone Communication: Basic Telephone Skills, Advanced Telephone Skills, Essential Telephone Skills.

Week 05 : Technology And Communication: Technological Personality?, Mobile Personality?, E-Mail Principles, How Not To Send E-Mails!, Netiquette, E-Mail Etiquette.

Week 06 : Communication Skills: Effective Communication, Arising Out Of Sender/Receiver's Personality; Barriers To Communication: Interpersonal Transactions, Miscommunication; Non-Verbal Communication: Pre-Thinking Assessment-1 & 2.

Week 07 : Nonverbal Communication: Introduction And Importance, Issues And Types, Basics And Universals, Interpreting Non-Verbal Cues; Body Language: For Interviews, For Group Discussions.

Week 08 : Presentation Skills: Overcoming Fear, Becoming A Professional, The Role Of Body Language, Using Visuals, Reading Skills: Effective Reading, Human Relations: Developing Trust And Integrity.

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Certification Course

on

Retail Management (CCBS 03)

Offered by

School of Business Studies

Shobhit Institute of Engineering and Technology

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Retail Management

Certification Code

This integrated certificate course in retail management, concentrates on the Retail sector's emerging and the most prevalent trends. The Retail world's most crucial aspects like Category Management, Retail Buying, Store Operations, Customer Marketing and Retail Strategies have been rightly explored. This may help individuals embark on a career in one of the many roles in the Retail industry.

Why should one take this certification?

This Course is intended for professionals and graduates wanting to excel in their chosen areas. It is also well suited for those who are already working and would like to take certification for further career progression.

Earning Vskills Retail Management Professional Certification can help candidate differentiate in today's competitive job market, broaden their employment opportunities by displaying their advanced skills, and result in higher earning potential.

Who will benefit from taking this certification?

Job seekers looking to find employment in retail departments of various companies, students generally wanting to improve their skill set and make their CV stronger and existing employees looking for a better role can prove their employers the value of their skills through this certification.

Course Duration

30 Hrs.

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Table of Contents

7. The Demand-Driven Supply Chain

7.1 Vision for The Demand-Driven Supply Chain
7.2 The Path From Forecast-Driven To Demand-Driven Supply Chain
7.3 Demand-Driven Tools And Techniques
7.4 Sponsoring The Demand-Driven Supply Chain

8. Product Tracking Along Retail Supply Chains

8.1 Introduction
8.2 Low Tech Retailing
8.3 Beyond Basic Bar Codes
8.4 Radio Frequency Identification
8.5 Tracking In Transit
8.6 The Future Of Product Tracking

9. Understanding Supply Chain Costs

9.1 Introduction
9.2 Barriers To Cost Visibility
9.3 Goal: Activity-Based Costing By Product
9.4 The Starting Point (i-a)
9.5 Department Costs With Capital Recovery (ii-b)
9.6 Multicompany Process Cost (iii-c)
9.7 Activity-Based Costs By Product (iv-d)
9.8 Understanding costs—summary

10. Retail Return

10.1 Introduction
10.2 Genco Case Study—The Rise Of The Return Loop
10.3 Types of Returns
10.4 Opportunities In Returns

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Certification Course

on

Solar Power Technology

(CCEE 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

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SOLAR POWER TECHNOLOGY

PRE-REQUISITES : Basic knowledge of heat transfer, thermodynamics and fundamentals of physics

COURSE DURATION: 35 Hrs.

INTENDED AUDIENCE : UG, PG and Doctorate students

INDUSTRIES APPLICABLE TO : This course will be very much effective for the engineers working in the Solar Industries

COURSE OUTLINE :

The course content is designed to provide comprehensive knowledge on solar radiation, analysis of solar radiation data, fundamentals of the solar thermal and photovoltaic system along with storage of energy required for effective design of efficient solar energy conversion devices. The concepts will be illustrated with practical examples, schematics and block diagrams wherever required. A sufficient number of numerical problems with solutions will be discussed in the course. This course is specifically designed for undergraduate and postgraduate students of Energy Engineering and Technology. Further, the course will be very much useful for students and researchers from varied academic backgrounds for the synthesis of novel energy conversion devices and processes.

COURSE PLAN :

Week 1: Energy Scenario, overview of solar energy conversion devices and applications, physics of propagation of solar radiation from the sun to earth.

Week 2: Sun-Earth Geometry, Extra-Terrestrial and Terrestrial Radiation, Solar energy measuring instruments

Week 3: Estimation of solar radiation under different climatic conditions, Estimation of total radiation

Week 4: Fundamentals of solar PV cells, principles and performance analysis, modules, arrays, theoretical maximum power generation from PV cells

Week 5: PV standalone system components, Standalone PV-system design.

Week 6: Components of grid-connected PV system, solar power plant design and performance analysis.

Week 7: Fundamentals of solar collectors, Snails law, Bougers law, Physical significance of Transmissivity - absorptivity product.

Week 8: Performance analysis of Liquid flat plate collectors and testing

Week 9: Performance analysis of Solar Air heaters and testing

Week 10: Solar thermal power generation (Solar concentrators).

Week 11: Thermal Energy Storage (sensible, latent and thermo-chemical) and solar pond

Week 12: Applications: Solar Refrigeration, Passive architecture, solar distillation, and emerging technologies.

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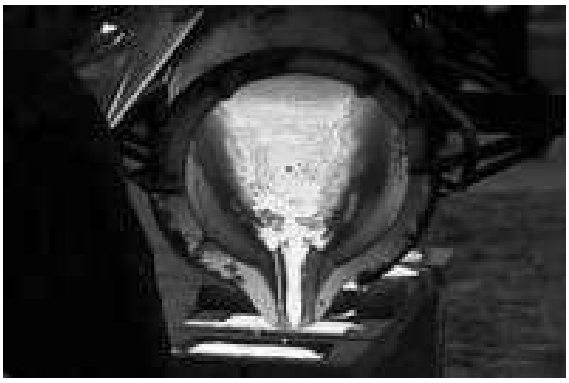
"An Investment in Knowledge pays the best interest"

School of Engineering and technology invites you for certification Course on

"METAL CASTING"

Date: 11 June to 22 June 2018



Timings: 10:00 am to 1:00 pm daily

Fees: 1000 INR

Registrar
Shobhit Institute of Engg. & Tech.
(Deemed to-Be University)
NH-58, Modipuram, Meerut-250110

Department of Mechanical engineering

Shobhit Institute of Engineering and Technology, Meerut

(A NAAC Accredited deemed to be University)

NH-58, Modipuram, Meerut – 250110

Website: www.shobhituniversity.ac.in

Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

A Short Term Course
on
Application of Advanced Tools and Techniques in Biological Sciences

Date:
4 September
to
20 September
2017

Venue:
Biomedical Lab.

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Biomedical Engineering

Shobhit Institute of Engineering & Technology, Meerut

(A NAAC Accredited Deemed-to-be University)

NH-58, Modipuram, Meerut - 250 110

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NH-58, Modipuram, Meerut-250110

Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

Personality Development Program

Date:
09 Oct.
to
26 Oct. 2017

Venue:
University Auditorium

Time:
3:00 pm to 5:00 Pm

Organized by

University Training and Development Cell

Shobhit Institute of Engineering & Technology, Meerut

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Shobhit
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EDUCATION EMPOWERS

Skill Development Program

Date:
16 Aug.
to
01 Sept. 2017

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

University Training and Development Cell

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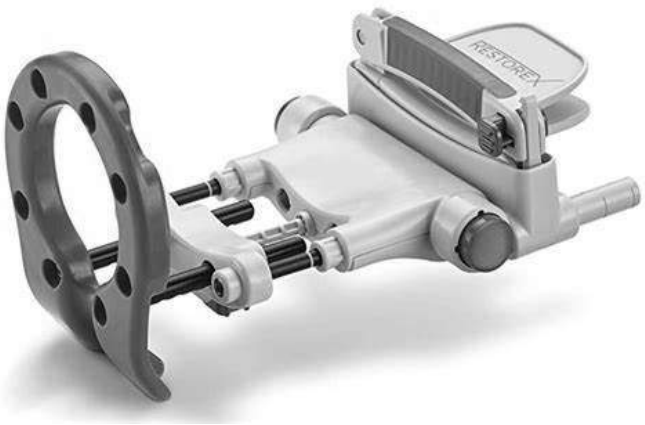
Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

Hands on Training and Workshop
on
Therapeutic Devices in Bio-Engineering and Sciences

Date:
4 October
to
21 October
2017



Venue:
Biomedical Lab.

Time:
3:00 pm to 5:00 Pm

Organized by

Department of Biomedical Engineering

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Shobhit
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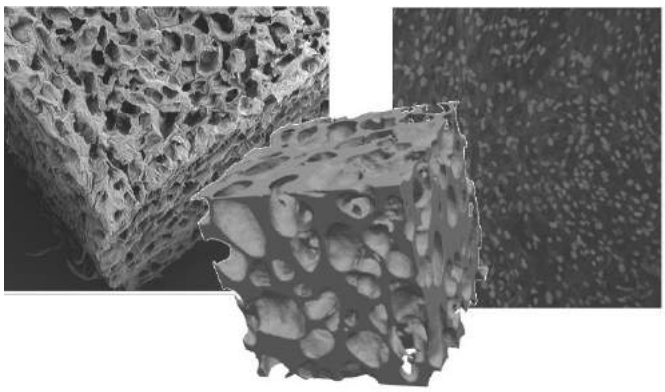
EDUCATION EMPOWERS

Workshop
on
Physiochemical Characterization of Biomaterials

Date:
12 March
to
29 March
2018



Venue:
Biomedical Lab.

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Biomedical Engineering

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Deemed to-be-University

EDUCATION EMPOWERS

School of Engg. and Tech. invites you for

Workshop
on
Real time processing system using FPGA

Date
04 June to
20 June
2018

Time
2:00 pm
to
5:00 pm

Registrar
Shobhit Institute of Engg. & Tech.
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NH-58, Modipuram, Meerut-250 110

Organized
By

Department of Electronics and Communication Engineering

Shobhit Institute of Engineering & Technology, Meerut

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NH-58, Modipuram, Meerut - 250 110

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Shobhit
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Deemed to-be-University

EDUCATION EMPOWERS

"An Investment in Knowledge pays the best interest"

School of Engineering and technology invites you for certification Course on

"QUAD-ROTOR DESIGN & FLY"

Date: 12 Sept to 26 Sept 2017

Timings: 10:00 am to 1:00 pm daily

Fees: 1000 INR

Registrar
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NH-58, Modipuram, Meerut-250110

Department of Mechanical engineering

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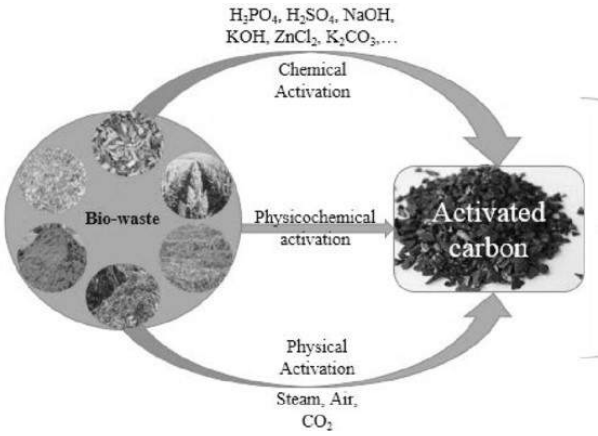
Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

Training and Workshop
on
Agricultural waste to commercially activated Carbon

Date:
3 June
to
19 June
2018



Venue:
Biomedical Lab.

Time:
3:00 pm to 5:00 Pm

Organized by

Department of Biomedical Engineering

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Shobhit
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EDUCATION EMPOWERS

A Short Term Course
on
Tools and Technology in Biotechnology

Date:
25 June
to
07 July 2018

Venue:
Biotechnology Lab

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Biotechnolgy

Shobhit Institute of Engineering & Technology, Meerut

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EDUCATION EMPOWERS

Workshop on
on
Android App Development

Date:
11 Sept.
to
23 Sept.
2017

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Computer Science and Engineering

Shobhit Institute of Engineering & Technology, Meerut

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Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

School of Engg. and Tech. invites you for workshop On

Non Conventional Energy Resources

Date
4 Sept.
to
22 Sept.
2018

Time
2:00 pm
to
5:00 pm

Organized By

Department of Electrical Engineering

Registrar
Shobhit Institute of Engg. & Tech.
(Deemed to-Be University)
NH-58, Modipuram, Meerut-250110

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NH-58, Modipuram, Meerut - 250 110
Website: www.shobhituniversity.ac.in

Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

Certification Course

on

Acoustical Physics of Music

(CCAS 01)

Offered by

School of Basic and Applied Sciences

Shobhit Institute of Engineering and Technology

(Deemed to be University)

Registrar
Shobhit Institute of Engg. & Tech.
(Deemed to-Be University)
NH-58, Modipuram, Meerut-250110

SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

Acoustical Physics of Music

Prerequisites: None

Course Objective: To provide a fundamental physical understanding of the nature of sound, hearing, and music.

Course Duration: 40 Hrs.

Course Description:
We will begin to explore increasingly intricate aspects of how simple waves are combine in extremely precise ways to create the complex sounds we experience in everyday life, with a focus on how our perception of these sounds works, how the phenomenon of music arises, how certain instruments create their own unique versions of it, and how music is recorded and/or presented to an audience. We understand that most of you are not majors in science or engineering, so some of the technical concepts will be new to you.

Unit 1. Oscillations, Waves and Sound

Simple harmonic oscillations. Amplitude, period, and frequency (pitch). Harmonic oscillations with slowly changing parameters. Perception of sound. Combinations of harmonic oscillations. Beats. Phase relations and psychoacoustical Ohm's law, phase beats. Damped and driven oscillations, resonance. Periodic waves, solitary waves, wave packets. Wave length, sound velocity. Spherical and cylindrical waves. Longitudinal and transverse waves. Surface acoustic waves. Reflection and refraction of waves. Refraction of sound in the atmosphere. Doppler effect. Sonic booms and shock waves.

Unit 2. Standing Waves and Overtone Series

Standing waves in general. Role of boundary conditions in the formation of standing waves. Node-node, antinode-antinode, and node-antinode boundary conditions. Overtone's series. Mersenne's laws. Analysis and Synthesis of Complex Waves: Synthesis of complex waves. Fourier analysis and Fourier spectra. Analysis of tone quality: Attacks and decays, formants. Vibrato and tremolo. Discrete and continuous Fourier spectra. Spectrograms: Narrow-band and wide-band.

Unit 3. Hearing, Speech and singing

Transmission of the signal through the ear parts. Place theory of hearing: Frequency response and frequency resolution. amplitude and the intensity of the sound. neurophysiology of the hearing process. Sensitivity of the ear to the sound intensity. The decibel scale of sound

intensity level. Nonlinearity of the ear. Aural harmonics. Combinational tones. Fundamental tracking. Cochlear implants as a confirmation of the place theory of hearing. Structure of speech and singing apparatus. Throat and mouth as a resonator. Naive open-closed-pipe theory of the throat-mouth resonator. Resonances as formants in shaping the output sound. Production of the glottal wave by the vocal folds, Bernoulli law. Difference between singing, speech, and hoarse speech. Simplified two-formant synthesis of vowels.

Unit 4. Room and auditorium acoustics

Direct and reflected sound. Texture of the echo. Definition of the reverberation time. Fullness and clarity. Warmth and brilliance. Formula for the reverberation time. Absorption and reflection coefficients. Resonances in room of a box. shape. General principles of constructing concert halls. architectural acoustics and the science of reverberation, Sabine equation. Basic parameters, design and modification of spaces using different types of absorbers and treatments. Active methods of noise reduction and room treatment (e.g., phantom acoustic shadows). Diffusion through reflection-phase gratings (quadratic-residue and primitive-root diffusers). Helmholtz resonators. Room dimensions.

Unit 5. Equipment used for recording music

Microphones and preamplifiers, analog (tape and records) and digital formats for recording. **Home playback and reproduction of music** – general categorization of mass-Fi, mid-Fi and HiFi qualities and philosophies. Sources (tape, record, CD, DVD-audio, SACD, etc.), preamplifiers (tubes and solid-state, chips vs discrete), amplifiers, speakers (dynamic, electrostatic, planar magnetic, etc.). Room choice and placement of components. Wiring and interfacing (concept of impedance mismatch and mechanical and dielectric degradation). **Working of some acoustical and electronic musical instruments** – electric guitar and its effects, etc.

Learning outcomes: At the end of this course students will be able to

1. Understand how a harmonic oscillator works and the concepts of resonance and formants.
2. Understand the concepts and interrelationships between wavelength, frequency, and speed of a wave.
3. Understand the origin of harmonics in string and wind instruments.
4. Understand the concepts of loudness, intensity levels and decibels.
5. Understand some basics of the neurophysiology of the hearing process and the causes of hearing loss.
6. Understand tones and the basic of musical scales.

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EDUCATION EMPOWERS

Certification Course

on

Automotive Technology Level 1

(CCME 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

Registrar
Shobhit Institute of Engg. & Tech.
(Deemed to-Be University)
NH-58, Modipuram, Meerut-250110

SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

Course Descriptions and Outlines

Automotive Technology

Level 1

Course Description

Duration: 60 Hrs.

Term: 3 Hours per day

Prerequisite: none

Description: This is the study of an automobile. There will be a hands-on experience class involving activities that relate directly to maintenance, repair and service. The program of instruction may include: safety in the shop, care and use of tools, interpretation of parts books, parts handling, engine construction, ignition systems, fuel systems, charging systems, starting systems, electronic systems, chassis wiring and diagrams, brakes, lubrications and minor tune-up. Students may be involved in BMW Skill Next Program.

Course Outline

Orientation	Introduce Develop Master
A. Occupational outlook	I
B. Places that employ auto mechanics	I
C. Student requirements for the auto mechanics program	I/D
D. Steps involved in automotive shop work	I/D
E. Skills USA	I
F. Ways Skills USA state and national dues are used	I
G. Mandan automotive program rules	I/D
H. MSDA	I/D
I. Personal information sheet	I/D/M
J. Follow instructions sheet	I/D/M
K. Job application form	I/D/M

Safety	
I. Safety	
A. Terms related to the unit	I/D/M
B. Colors and application of the safety color code	I/D/M
C. Personal safety rules	I/D/M
D. General shop safety rules	I/D/M
E. Safety rules involving hand tools	I/D/M
F. Safety rules involving the engine	I/D/M
G. Battery safety	I/D/M
H. Safety rules involving flammable liquids	I/D/M
I. Equipment safety rules	I/D/M
J. Components of the fire triangle	I/D/M
K. Classes of fire	I/D/M
L. Types of fire extinguishers	I/D/M
II. Machine Safety Rules	
A. Parts washer	I/D/M
B. Engine hoist	I/D/M
C. Grinder	I/D/M
D. Hydraulic press	I/D/M
E. Drill press	I/D/M
F. Hoist	I/D/M
G. Floor jack	I/D/M
H. Pressure washer	I/D/M
III. Automotive lift	
A. Safety tips	I/D/M
B. Safety pledge form	I/D/M
IV. Safety Review	
A. Individual Student Shop Safety Inspection Form	I/D/M
Hand Tools	
A. Purpose of hand tools & storage	I/D/M
B. Types of screwdrivers	I/D/M
C. Types of pliers	I/D/M
D. Types of wrenches	I/D/M
E. Components of a socket set	I/D/M

F. Types of sockets	I/D/M
G. Special purpose sockets	I/D/M
H. Types of hammers used in the auto shop	I/D/M
I. Types of punches	I/D/M
J. Types of chisels	I/D/M
K. Types of files	I/D/M
L. Types of file teeth	I/D/M
M. Types of parts cleaning tools	I/D/M
N. General shop tools	I/D/M
O. Battery service tools	I/D/M
P. Starter service tools	I/D/M
Q. Charging system service tools	I/D/M
R. Ignition service tools	I/D/M
S. Fuel system service tools	I/D/M
T. Exhaust system service tools	I/D/M
U. Cooling system service tools	I/D/M
V. Lubrication service tools	I/D/M
W. Brake service tools	I/D/M
X. Front-end service tools	I/D/M
Y. Engine repair tools	I/D/M
Z. Drive line service tools	I/D/M
AA. General Torque Specification Chart	I
Rules and Measures	
I. Rules	
A. Terms related to the unit	I
B. Basic units of measurement	I/D
C. Fractional units found on rules	I/D
D. Decimal units found on rules	I/D
E. Metric units found on rules	I/D
F. Rules used in shop work	I
G. Uses of the rule with accessories	I
H. Procedure for using rules	I/D
I. Steps for reading the rules	I/D
II. Outside micrometer	
A. Types of measurements found on the outside micrometer	I/D/M
B. Major parts of the outside micrometer	I
C. Steps in selecting the proper size outside micrometer	I/D/M

D. General rules for use and care of micrometers	I/D
E. Definition of "feel" when using a micrometer	I/D
F. Methods of checking accuracy of outside micrometers	I/D/M
G. Reading the plane micrometer	I/D/M
H. Reading the vernier micrometer	I/D/M
Service Manuals	
A. Car information section	I/D/M
B. General service information section	I/D/M
C. Carline unit index	I/D/M
D. Specification sheets	I/D/M
E. Repair information section	I/D/M
F. Labor and parts guide	I/D/M
G. Repair order	I/D/M
Electrical Unit	
I. Basic electrical theory	
A. Terms related to basic electricity	I
B. Parts of the atom and their values	I
C. Electricity according to the electron theory	I
D. Basic factors of electrical flow in a circuit	I
E. Relationship of voltage, amperage, and ohms to current flow	I/D
F. Ohms Law	I/D/M
G. Calculating problems using Ohms Law	I/D/M
H. Factors effecting resistance in a conductor	I/D
I. Basic electrical symbols	I/D/M
J. Components of a basic electrical circuit	I/D/M
K. Types of electrical circuits	I/D/M
L. Instruments for testing electrical circuits	I/D/M
M. Methods of connecting test instruments	I/D/M
N. Basic electrical circuit failures	I/D
O. Characteristics of magnetism	I/D
P. Characteristics of electromagnetism	I/D
Q. Electromagnetic induction	I/D
R. Factors determining magnitude of induce voltage	I/D

II. Battery service	
A. Terms related to the battery	I
B. Functions of a battery	I/D
C. Purposes of the battery parts	I/D
D. Converting chemical energy into electrical energy	I/D
E. Factors affecting battery voltage and capacity	I/D
F. Battery capacity in amperes	I/D
G. Types of battery rating	I/D
H. Safety rules	I/D/M
I. Features of a service-free battery	I
J. Jump starting a vehicle	I/D
III. Charging system	
A. Purpose of the charging system	I/D
B. Terms related to the charging system	I
C. Charging system components	I
D. Parts of the generator	I
E. Parts of the alternator	I/D/M
F. Differences between an alternator and generator	I/D
G. Advantages of a alternator over a generator	I/D
H. Reason an alternator produces more current at low speed than a generator	I/D
I. Stator construction	I/D
J. Types of stator windings	I/D
K. Current and voltage regulation in an alternator	I/D
L. Types of voltage regulators for alternators	I/D
M. Troubleshooting the charging system	I/D/M
IV. Starting system	
A. Terms related to the starting system	I/D
B. Purpose of the starting system	I/D
C. Operating principle of the starter	I
D. Magnetic principles of the starter	I
E. Path of current flow in a series wound starter	I
F. Components of the starting system	I/D
G. Types of starter switches	I/D
H. Parts of the starter	I/D/M
I. Major parts of the gear reduction starter	I/D/M
J. Types of starter drives	I/D
K. Components of a starter control circuit	I/D
L. Starting system control circuit components and their functions	I/D
M. Troubleshooting the starting system	I/D/M

V. Ignition system	
A. Terms related to the ignition system	I/D
B. Purpose of the ignition system	I/D
C. Components of the ignition system	I/D
D. Function of the ignition system components	I/D
E. Distributor components	I/D/M
F. Components of the ignition system circuits	I/D
G. Operation of the ignition system	I/D
H. Parts of the spark plug	I
I. Spark plug heat ranges	I
J. Spark plug conditions and their causes	I/D/M
K. Types of secondary ignition cables	I/D
L. Transistorized and capacitive discharge ignition system	I
M. Relationship of the electronic ignition system to the conventional ignition system	I/D
N. Advantages of the electronic ignition system	I/D
O. Major components of the electronic ignition system	I/D/M
P. Function of the components of the electronic ignition system	I/D
Q. Operation of the electronic ignitions system	I/D
VI. Chassis wiring	
A. Terms related to chassis wiring	I
B. Electrical symbols	I/D
C. Types of electrical terminals and connectors	I/D
D. Types of bulbs used in automobiles	I
E. Parts of the sealed beam	I
F. Differences between hot and ground circuits	I/D
G. Facts about voltage drop	I/D/M
H. Facts about current draw	I/D/M
I. Single and two-wire circuits	I/D
J. Instruments used in testing automobile electrical circuits	I/D/M
K. Steps in diagnosis of an electrical problem	I/D/M
L. Characteristics of a wiring diagram	I/D/M
M. Parts of a typical circuit identification code	I/D/M
Brake Unit	
I. Wheel bearings	
A. Terms related to unit	I/D
B. Types of front wheel bearings	I/D/M
C. Parts of a tapered roller front wheel bearing assembly	I/D/M

D. Characteristics of quality wheel bearing grease	I
E. Precautions to observe while packing wheel bearings	I/D/M
II. Brake systems	
A. Purpose of the brake system	I/D
B. Terms related to unit	I/D
C. Components of the standard brake system	I/D/M
D. Components of the tandem or dual brake system	I/D/M
E. Parts of a standard master cylinder	I/D/M
F. Parts of a tandem master cylinder	I/D/M
G. Parts of a wheel cylinder	I/D/M
H. Parts of a standard brake assembly	I/D/M
I. Types of self-adjusting brake systems	I/D
J. Brake operation	I/D/M
III. Power disc brakes	
A. Terms related to unit	I/D
B. Major components of the disc brake system	I/D
C. Disc brake components and their functions	I/D
D. Types of disc brake calipers	I
E. Parts of a floating caliper disc brake	I/D/M
F. Characteristics of disc brakes	I
G. Reasons disc brakes may require power booster units	I/D
H. Sources of energy used for power boosters	I
I. Types of vacuum operated power boosters	I/D
J. Major parts of a vacuum operated power booster	I
K. Major parts of a hydro-boost power booster	I
L. Operation of the vacuum suspended power booster	I/D/M
M. Operation of the atmospheric suspended power booster	I/D/M
N. Operation of the hydro-boost power booster	I/D/M
O. Requirements of super heavy-duty brake fluid	I
P. Conditions that are considered normal and are not indications that the master cylinder needs service	I/D/M
Q. Parts of a parking brake system on four wheel disc brakes	I
IV. Anti-lock brake system	
A. Safety precautions	I/D/M
B. Lug nut torque specifications	I/D/M
C. Description	I
D. Operation	I
E. Diagnosis and testing	I/D
F. Note on intermittents	I

G. Depressurizing the system	I/D
H. Component removal and installation	I
J. Wheel sensor air gap	I
K. Bleeding brake system	I/D/M
L. Reading wiring diagrams	I/D
M. Pin-out checks	I

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
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Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

Certification Course

on

Automotive Technology Level 2

(CCME 02)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

Registrar
Shobhit Institute of Engg. & Tech.
(Deemed to-Be University)
NH-58, Modipuram, Meerut-250110

SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

Automotive Technology

Level 2

Course Description

Duration: 60 Hrs.

Term: 3 Hours per day

Prerequisite: Automotive Technology Level 1

Description: This is a continuation of the Automotive Technology Level 1 course with more advanced training and more skill required in the use of tools and equipment. This course is designed to give the students the opportunity to learn practical application along with the related material in the following areas: engine rebuilding, transmissions, clutch, drive train, differentials, major tune-up, and electronic emission control systems. The students may be involved in the BMW Skill Next Program.

Course Outline

Engine Repair	Introduce Develop Master
I. Basic Engine Principles	
A. Terms related to the unit	I
B. Characteristics of energy	I
C. Types of energy	I
D. Forms of available energy	I
E. Types of motion	I
F. Simple machines	I
G. Uses of simple machines	I
H. Calculating work	I/D
I. Calculating horsepower	I/D
J. Formula for torque	I/D
K. Characteristic of heat engines	I
L. Types of heat engines	I
M. Parts of basic internal combustion engine	I/D

N. Process for converting chemical energy into rotary motion	I
O. Operation of four-stroke cycle engine	I/D/M
P. Valve timing and overlap	I/D
Q. Operation of two-stroke cycle engine	I/D
R. Formula for cubic inch displacement	I/D
S. Results of increasing compression ratio	I/D
T. Components of an automobile engine	I/D
U. Gasoline and diesel engines	I
V. Purpose of a heavy flywheel	I
II. Engine Condition Evaluation	
A. Terms related to unit	I
B. Conditions causing low oil pressure	I/D
C. Conditions that cause oil consumption	I/D
D. Items to inspect for engine condition evaluation	I/D/M
E. Items to check prior to testing for internal engine noise	I/D/M
F. Internal engine noise diagnosis	I/D/M
III. Engine Removal	
A. Terms related to unit	I
B. Safety precautions to observe while removing an engine	I/D/M
IV. Engine Disassembly	
A. Terms related to unit	I/D
B. Safety precautions to observe during engine disassembly	I/D/M
C. Factors to consider when preparing to disassemble an engine	I/D
D. Items to inspect during engine assembly	I/D/M
V. Valve Train and Cylinder Head Reconditioning	
A. Terms related to unit	I/D
B. Purpose of the valve train	I
C. Parts of the valve train	I/D
D. Function of valve train parts	I/D
E. Camshaft locations	I
F. Methods of driving the camshaft	I/D
G. Parts of the camshaft	I/D
H. Parts of the cam lobe	I/D/M
I. Types of valve lifters	I/D/M
J. Parts of a hydraulic valve lifter	I/D/M
K. Operation of a hydraulic valve lifter	I/D
L. Parts of the valve	I/D/M
M. Parts of a valve assembly	I/D/M
N. Types of valve springs and dampering devices	I/D/M

O. Types of valve stem seals	I/D/M
P. Types of valve spring keepers	I/D/M
Q. Purpose of valve spring spacer	I/D
R. Types of valve rotators	I/D
S. Purpose of valve rotator	I/D
T. Reasons a valve must seat properly	I/D/M
U. Causes of valve burning	I/D/M
V. Tools of valve reconditioning	I/D/M
VI. Engine Crankshaft, Bearings and Oil Pump	
A. Terms related to unit	I
B. Purpose of the crankshaft	I/D
C. Parts of the crankshaft	I/D
D. Methods used to manufacture crankshafts	I
E. Types of bearing used on the cam and crankshaft	I/D
F. Construction of an insert bearing	I
G. Bearing spread and crush	I/D
H. Bearing requirements	I/D
I. Causes of bearing failure	I/D/M
J. Action of lubricating oil in an insert bearing	I/D
K. Purpose of torsional vibration damper and flywheel	I
L. Types of rear main bearing oil seals	I/D
M. Types of oil pumps	I/D
N. Parts of an oil pump	I/D
O. Conditions that could lower oil pressure	I/D/M
VII. Cylinder and Piston Reconditioning	
A. Terms related to unit	I
B. Cylinder wear patterns	I/D
C. Methods of reconditioning cylinders	I/D/M
D. Types of cylinder sleeves	I
E. Reasons cylinders wear tapered	I/D
F. Parts of the cylinder block	I/D
G. Types of cylinder block core hole plugs	I/D
H. Parts of a piston and connecting rod assembly	I/D
I. Types of compression rings	I/D
J. Methods of installing compression rings	I/D/M
K. Types of oil rings	I/D
L. Methods of installing oil rings	I/D/M
M. Methods of heat and expansion control in the piston	I
N. Piston conditions and related causes	I/D/M

O. Lubrication of cylinder walls and piston pins	I/D
P. Tools and equipment used in reconditioning cylinders and pistons	I/D/M
Q. Types of piston pin locks	I/D
VIII. Engine Reassembly	
A. Terms related to unit	I
B. Tools used in engine reassembly	I/D/M
C. Reasons for torqueing bolts to specifications in an engine	I/D/M
IX. Engine Installation	
A. Terms related to unit	I
B. Safety precautions to observe during engine installation	I/D/M
C. Factors to consider when installing an engine	I/D/M
D. Items to check or adjust before starting a new or rebuilt engine	I/D/M
E. Break-in procedure	I/D/M
X. Cooling System	
A. Purpose of the cooling system	I/D
B. Terms related to unit	I
C. Types of thermostats	I/D
D. Thermostat operation	I/D/M
E. Job performed by the cooling system	I/D
F. Downflow and crossflow radiators	I
G. Methods of cooling the internal combustion engine	I/D
H. Types of radiator hoses	I/D
I. Pressure cap operation at various temperatures	I/D/M
J. Variable-speed fan drive operations	I/D/M
K. Reasons for using permanent antifreeze solution	I/D
L. Operation of the coolant recovery system	I/D
M. Belt tension	I/D/M
N. Belt inspection	I/D/M
XI. Engine Lubrication System	
A. Terms related to unit	I
B. Purpose of the engine lubrication system	I
C. Components of the engine lubrication system	I/D
D. Purposes of the components of the engine lubrication system	I/D
E. Types of oil filters	I/D
F. Engine oil classifications	I
G. Oil viscosity classifications	I
H. Oil service designation letters and their descriptions	I
I. Points to consider when selecting engine oil	I/D
J. Additives found in engine oil	I

XII. Exhaust System	
A. Purpose of the exhaust system	I
B. Terms related to unit	I
C. Types of mufflers	I
D. Operation of the manifold heat control valve	I
E. Construction and operation of catalytic converter	I
F. Tools for exhaust system service	I
G. Types of exhaust systems	I
H. Prevention of carbon monoxide poisoning	I/D
I. Causes of corrosion of exhaust system	I
J. Basic components of the exhaust gas recirculating system	I
K. Purpose of exhaust gas recirculating system	I
XIII. Fuel System	
A. Purpose of the fuel system	I
B. Terms related to unit	I
C. Components of the fuel system and their purposes	I
D. Fuel pump operation	I
E. Types of fuel filters	I
F. Types of air cleaners	I
G. Parts of the carburetor	I
H. Carburetor systems and their uses	I
I. Gasoline additives and their purposes	I
J. Fuel injection	I
K. Variations of fuel injection systems	I
Manual Drive Train	
I. Clutch Assembly	
A. Terms related to the unit	I
B. Components of the clutch assembly	I/D
C. Parts of a clutch disc	I
D. Types of pressure plates	I/D
E. Clutch operation	I/D
F. Methods used to actuate clutch release	I
G. Mechanisms that allow smooth clutch engagement	I
H. Conditions to look for during clutch inspection	I/D/M
I. Symptoms that may occur when a clutch housing bore has excessive run-out	I
J. Clutch malfunctions and probable causes	I/D/M
K. Problems not requiring clutch removal	I/D/M

L. Clutch problems requiring clutch removal	I/D/M
II. Standard Transmission	
A. Purpose of the transmission	I
B. Terms related to the unit	I
C. Parts of the transmission	I/D/M
D. Parts of a synchronizer	I/D/M
E. Types of gear teeth	I/D/M
F. Three-speed synchromesh transmission operation	I/D/M
G. Gear operation of a three-speed transmission	I/D/M
H. Basic types of overdrives	I
I. Major parts of the electrically operated overdrive	I
J. Operation of the electrically operated overdrive	I
K. Procedure for performance testing shift linkage adjustment	I/D/M
L. Procedure for performance testing the manual transmission	I/D/M
III. Drive Lines	
A. Terms related to the unit	I
B. Types of drive lines	I
C. Components of a propeller shaft	I
D. Types of U-joints	I
E. Parts of a cross and roller or cardan U-joint	I/D/M
F. Parts of a ball and trunnion U-joint	I
H. Parts of a constant velocity U-joint	I/D/M
I. Acceleration-deceleration of propeller shaft equipped with a cross and roller U-joint	I
J. Major components of a four wheel drive	I
K. Tools used in drive line repair	I
L. Methods of controlling drive line vibration	I
IV. Rear Axle	
A. Purpose of the rear axle assembly	I
B. Terms related to the unit	I
C. Parts of a gear tooth	I/D/M
D. Parts of a conventional differential	I/D/M
E. Parts of the planetary differential	I/D/M
F. Types of differential carrier housings	I/D
G. Ring gear and drive pinion tooth contact pattern	I/D/M
H. Gear tooth contact patterns	I/D/M
I. Types of rear axle shafts	I/D
J. Types of rear axle bearings	I/D
V. Automatic Transmission Service	
A. Terms related to the unit	I

B. Repairs which can be performed with the transmission in the vehicle	I
C. Items to include in a automatic transmission tune-up	I
D. Tests that are performed while transmission is in the vehicle	I/D
E. Types of automatic transmission fluids and their applications	I/D/M
F. Procedure for properly checking transmission fluid level	I/D/M
G. Fluid conditions and possible transmission problems	I/D
H. Types of transmission filters	I
VI. Manual Transaxle Operation	
A. Terms related to the unit	I
B. Transaxle components and how they function	I/D/M
C. Transaxle operation	I/D
VII. Manual Transaxle Diagnosis	
A. The operation and design	I/D/M
B. Half shaft diagnosis	I/D/M
VIII. Transaxle Removal and Disassembly	
A. Safety in transaxle removal	I/D/M
B. Procedure for removing the transaxle	I/D
C. Transaxle disassembly	I/D/M
IX. Transaxle Cleaning, Inspection and Assembly	
A. Procedure for cleaning and inspecting transaxle components	I/D/M
B. Clutch inspection	I/D/M
C. Procedure for reassembling and adjusting the transaxle	I/D/M
D. Half shaft repair procedures	I/D/M
X. Transaxle Installation and Performance Testing	
A. Transaxle installation	I/D
B. Procedures for performance testing the transaxle	I/D
XI. Four-Wheel-Drive Components and Operation	
A. Terms related to the unit	I
B. Four-wheel-drive components and functions	I
C. Driveline operation	I
XII. Four-Wheel-Drive Diagnosis and Repair	
A. Safety in four-wheel-drive diagnosis and repair	I/D/M
B. Procedures for diagnosing a four-wheel-drive vehicle	I
C. Repair procedures for locking hubs	I
D. Procedure for removing the front differential assembly	I
E. Repair procedures for front spindals	I
XIII. Transfer Case Components and How They Function	
A. Transfer case components and their functions	I
B. Transfer case operation	I

XIV. Transfer Case Diagnosis and Removal	
A. Transfer case diagnosis	I
B. Safety in transfer case removal	I/D/M
C. Procedures for removing the transfer case	I
XV. Transfer Case Disassembly, Cleaning, Adjustment and Reassembly	
A. Procedure for disassembly of the transfer case	I
B. Procedure for cleaning and inspecting the transfer case	I
C. Transfer case end-play and torque measurements	I
D. Procedure for reassembly of the transfer case	I
XVI. Transfer Case Installation and Performance Testing	
A. Transfer case installation	I
B. Procedure for performance testing and transfer case	I

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EDUCATION EMPOWERS

Certification Course

on

Biomechatronics (CCBM 01)

Offered by

School of Biomedical Engineering

Shobhit Institute of Engineering and Technology

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Bio-Mechatronics

About Bio-Mechatronics:

Bio-Mechatronics is an applied interdisciplinary science that aims to integrate biology and mechatronics (electrical, electronics and mechanical engineering).

It also encompasses the fields of robotics and neuroscience. Biomechatronic devices encompass a wide range of applications from the development of prosthetic limbs to engineering solutions concerning respiration, vision, and the cardiovascular system.

Bio-Mechatronics is the integration of biological components with artificial devices, in which the biological component confers a significant functional capability to the system, and the artificial component provides specific cellular and tissue interfaces that promote the maintenance and functional adaptation of the biological component. Based upon functional performance, muscle is potentially an excellent mechanical actuator, but the larger challenge of developing muscle-actuated, biomechatronic devices poses many scientific and engineering challenges.

Course Duration: 30 Hrs.

Detailed Syllabus

Pre-requisites: Knowledge of Materials and their properties used in Manufacturing process Basic Knowledge of Electrical, Electronics, Mechanics and Biology.

Course Outcomes: At the end of the course, the student will be able to:

CO1	Explain the motivation, ethical issues and future challenges in bio-mechatronics.
CO2	Analyze the design and construction of biomechatronic technologies.
CO3	Evaluate the design and construction of biomechatronic technologies.
CO4	Apply appropriate dynamic models and computational tools to simulate and analyze biomechatronic systems.
CO5	Design simple biomechatronic systems using appropriate hardware instrumentation and end user.

Course Contents

Module 1 Introduction to Bio-mechatronics: clinical examples, highlights of technology, ethical issues and course outline. Nervous and muscular systems: the nervous system as a controller, sensory systems of the body, neurons and action potentials, muscles as actuators.

Module 2 Mechanics and materials: the body in motion, mechanical properties of tissues, mechanical analysis of body parts and their motion, materials and their properties for biomechatronic engineering.

Module 3 Electrodes: applications of electrodes, recording and stimulation of bioelectronic signals, electrode-tissue interface.

Module 4 Sensors, power sources and control: covering a range of sensors, power sources and control strategies used in bio-mechatronics. Prosthetic electronic skins.

Module 5 Bioprinting: 3D printing technologies in biomedicine, Signals: signal acquisition, processing and analysis. Filters, ADC and amplification of bioelectronic signals.

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Certification Course

on

Cyber Security (CCCS 04)

Offered by

School of Computer Science and Engineering

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Why take up this course?

- To gain the ability to define the design, architecture, and management of an organization's security
- To perform data loss prevention and risk analysis
- To acquire an understanding of the security architecture, models, engineering, and cryptography
- To get familiar with network security and communications, identity and access management, operations, and security testing

Career Prospects of this course

- IT Directors
- IT Security Consultants
- Security Auditors
- IT Managers
- Security Analysts
- Directors of Security
- Security Managers
- Network Architects
- Security Systems Engineers
- Security Architects
- Chief Information Security Officers

Program Curriculum

Cyber Security Training Course Content

1. **SECURITY AND RISK MANAGEMENT**
    - Regulatory and legal issues
    - Confidentiality, availability, and integrity concepts
    - Principles of security governance
    - Compliance and professional ethics
    - Requirements of business continuity
    - Policies of personnel security
    - Threat modeling and risk considerations
    - Security education, awareness, and training
    - Security policies, standards, procedures, and guidelines
2. **ASSET SECURITY**
    - Privacy protection
    - Asset and information classification
    - Ownership
    - Data security controls and appropriate retention
    - Requirements handling
3. **SECURITY ARCHITECTURE AND ENGINEERING**
    - Security evaluation models
    - Fundamental concepts of security models
    - Security designs, architectures, and solution elements vulnerabilities

- Information systems security capabilities
- Using secure design principles for engineering processes
- Vulnerabilities of web-based and mobile systems
- Cryptography
- Vulnerabilities of cyber-physical systems and embedded devices
- Secure principles of facility and site design
- Physical security

4. COMMUNICATION AND NETWORK SECURITY

- Architectural design of a secure network
- Channels for secure communication
- Components of a secure network
- Network attacks

5. IDENTITY AND ACCESS MANAGEMENT (IAM)

- Logical/physical access to assets management
- Authentication and identification management
- Integrating identity as a third-party service
- Mechanism of authorization
- Provisioning life cycle's identity and access

6. SECURITY ASSESSMENT AND TESTING

- Test outputs (e.g., manual and automated)
- Security process data (e.g., operational and management controls)
- Vulnerabilities of security architectures
- Testing of security control
- Test and assessment strategies

7. SECURITY OPERATIONS

- Monitoring and logging activities
- Investigation requirements and support
- Incident management
- Resource provision
- Concepts of foundational security operations
- Recovery strategies
- Techniques of resource protection
- Physical security
- Measures of prevention
- Vulnerability and patch management
- Processes of change management
- Exercises and planning of business continuity
- Personnel safety concerns
- Plans and processes for disaster recovery

8. SOFTWARE DEVELOPMENT SECURITY

- Security controls for development environment
- Software development life cycle security
- Impact of acquired software security
- Effectiveness of software security

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Certification Course

on

Digital Marketing (CCBS 02)

Offered by

School of Business Studies

Shobhit Institute of Engineering and Technology

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Digital Marketing

Overview:
In simple terms, digital marketing is the promotion of products or brands via one or more forms of electronic media. Digital marketing is often referred to as online marketing, internet marketing or web marketing.

Duration: 40 Hrs.

Course Objectives:

Digital marketing objectives should be SMART (Specific, Measurable, Achievable, Relevant and Time Related); and you should benchmark against your competitors to ensure that you are more effective.

Pre-requisite / Target Audience:

- No prior knowledge about marketing or digital marketing is required
- Speak and write English fluently
- Have broadband internet access
- Have basic PC skills and online access
- Be over the age of 18
- Be fully committed to Squared!

Module 1: Introduction to Digital Marketing:

In this module you will learn what is digital marketing, and importance of digital marketing. And you will also learn what is web site and levels of web site, Difference between blog, portal & website.

- What is digital marketing?
- How is it different from traditional marketing?
- ROI between Digital and traditional marketing?
- Discussion on Ecommerce
- Discussion on new trends and current scenario of the world?
- Digital marketing a boon or a Bane?
- How can digital marketing be a tool of success for companies?
- Video on importance of digital marketing
- Analysis of recent info graphics released by companies about digital marketing?
- How did digital marketing help the small companies and top inc
- Categorization of digital marketing for the business
- Diagnosis of the present website and business.

- Swot analysis of business, present website and media or promotion plan.
- Setting up vision,mission,and goals of digital marketing

Understanding a website

- What is a website?
- Levels of websites?
- Diff b/w Blog, Portal and Website?
- Diff b/w websites either static or dynamic

Module 2: Search Engine Optimization (SEO):

In this module you will learn complete about SEO (Search engine Optimization, what is On page optimization, Off page optimization, and you also learn how to prepare a reports like- Keywords, titles, meta tags etc..

- On page optimization techniques
- Off page Optimization techniques
- Reports

Module 3: Social Media Optimization (SMO):

In this module you will learn how to do SMO (Social Media Optimization) like Facebook, Twitter, LinkedIn, Tumblur, Pinterest and more social media services optimization.

- Introduction to social Media Marketing
- Advanced Facebook Marketing
- Word Press blog creation
- Twitter marketing
- LinkedIn Marketing
- Google plus marketing
- Social Media Analytical Tools

Module 4: Search Engine Marketing:

In this module you will learn what SME (Search Engine Marketing) is a paid tool like Google Adwords, now a days we have so many paid tools we discuss is briefly and display advertising techniques and all.

- Introduction to Search Engine Marketing
- Tools used for Search engine Marketing
- PPC /Google Adwords Tool
- Display advertising techniques
- Report generation

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Module 5: Additional Module:

In this module you will learn about tools for more useful to SEO, these tool used for analysis on website traffic, keyword analysis and also you can learn Email marketing and all.

- Google Analytics
- Online Reputation Management
- E-Mail Marketing
- Affiliate Marketing
- Social Media Analytics
- Ad designing

At the end of the course participants will be able to

1. Online & Offline SEO
2. Competitive Analysis For Smarter Marketing
3. You will learn how to use dozens of proven digital marketing strategies
4. You will learn how to use all of the most popular social media platforms to grow your business
5. You will see tangible results by taking action throughout the entire course
6. You will increase conversions and sales with real world techniques
7. You will improve your brand identity and grow your brand's audience

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Certification Course

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Ethical Hacking (CCCS 03)

Offered by

School of Computer Science and Engineering

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Who is a Certi ied Ethical Hacker?

A Certified Ethical Hacker is a specialist typically working in a red team environment, focused on attacking computer systems and gaining access to networks, applications, databases, and other critical data on secured systems. A CEH understands attack strategies, the use of creative attack vectors, and mimics the skills and creativity of malicious hackers. Unlike malicious hackers and actors, Certified Ethical Hackers operate with permission from the system owners and take all precautions to ensure the outcomes remain confidential. Bug bounty researchers are expert ethical hackers who use their attack skills to uncover vulnerabilities in the systems.

Course Description

The Certified Ethical Hacker (CEH) credential is the most trusted ethical hacking certification and accomplishment recommended by employers globally. It is the most desired information security certification and represents one of the fastest-growing cyber credentials required by critical infrastructure and essential service providers. Since the introduction of CEH in 2003, it is recognized as a standard within the information security community. CEH v11 continues to introduce the latest hacking techniques and the most advanced hacking tools and exploits used by hackers and information security professionals today. The Five Phases of Ethical Hacking and the original core mission of CEH remain valid and relevant today: "To beat a hacker, you need to think like a hacker."

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Certi ied Ethical Hacker (CEH) Version 11

CEH provides an in-depth understanding of ethical hacking phases, various attack vectors, and preventative countermeasures. It will teach you how hackers think and act maliciously so that you will be better positioned to set up your security infrastructure and defend future attacks. Understanding system weaknesses and vulnerabilities help organizations strengthen their system security controls to minimize the risk of an incident.

CEH was built to incorporate a hands-on environment and systematic process across every ethical hacking domain and methodology, giving you the opportunity to work towards proving the required knowledge and skills needed to perform the job of an ethical hacker. You will be exposed to an entirely different posture towards the responsibilities and measures required to be secure.

In its 11th version, CEH continues to evolve with the latest operating systems, tools, tactics, exploits, and technologies. Here are some critical updates of CEH v11:

Incorporating Parrot Security OS

When compared to Kali Linux, Parrot Security OS offers better performance on lower-powered laptops and machines while offering an intuitive look and feel with a larger repository of general tools.

Re-Mapped to NIST/NICE Framework

CEH v11 is mapped rigorously to important Specialty Areas under the NIST/NICE framework's Protect and Defend (PR) job role category overlapping with other job roles, including Analyze (AN) and Securely Provision (SP).

Enhanced Cloud Security, IoT, and OT Modules

CEH v11 covers updated Cloud and IoT modules to incorporate CSP's Container Technologies (e.g., Docker, Kubernetes), Cloud Computing threats, and a number of IoT hacking tools (e.g. Shikra, Bus Pirate, Facedancer21, and more). This is critical as the world moves towards broader and deeper cloud adoptions.

Cloud-Based Threats

As the cloud industry is estimated to reach $354 billion by 2022, the businesses struggle to limit the frequency of data theft incidents due to misconfigured cloud environments. January to April 2020 alone saw a 630% spike in cloud-based attacks. Learn how to avoid, identify, and respond to cloud-based attacks with CEH v11.

IoT Threats

Market reports anticipate that the worldwide IoT-connected devices are expected to reach 43 billion by 2023. To support this rapid expansion, the prominent players of the internet, including Amazon Web Services, Google, IBM, Microsoft, are swiftly shifting to private cloud services, creating complexities in IoT ecosystems. Learn to deal with IoT-based attacks with the CEH v11 course that covers the latest IoT hacking tools, such as Shikra, Bus Pirate, Facedancer21, and many others.

Operational Technology (OT) Attacks

Last year, businesses experienced a 2,000% increase in OT based incidents. You can gain expertise in OT, IT, and IIoT (industrial IoT) to secure a critical enterprise OT/IoT deployments. To learn the advanced skills of OT, CEH covers concepts of OT, such as ICS, SCADA, and PLC, various challenges of OT, OT hacking methodology, tools, communication protocols of an OT network like Modbus, Profinet, HART-IP, SOAP, CANopen, DeviceNet, Zigbee, Profibus, etc., and gaining Remote Access using DNP3 protocol.

Modern Malware Analysis

CEH v11 now includes the latest malware analysis tactics for ransomware, banking and financial malware, IoT botnets, OT malware analysis, Android malware, and more!

Covering the Latest Threats - Fileless Malware

As the security community observed a rise in fileless attacks, it began to raise concerns about fileless malware attacks. As fileless malware is a relatively new form of malware attack, organizations find it difficult to detect with endpoint security solutions. With the CEH v11, you can now learn various fileless malware techniques with associated defensive strategies, as the course focuses on the taxonomy of fileless malware threats, fileless malware obfuscation techniques to bypass antivirus, launching fileless malware through script-based injection, launching fileless malware through phishing, and more.

New Lab Designs and Operating Systems

This latest iteration of CEH v11 includes new operating systems, including Windows Server 2019, Windows Server 2016, and Windows 10 configured with Domain Controller, firewalls, and vulnerable web applications for practicing and improving hacking skills.

Increased Lab Time and Hands-on Focus

More than 50% of the CEH v11 course is dedicated to practical skills in live ranges via EC-Council labs. EC-Council leads in this aspect of the industry.

Industry's Most Comprehensive Tools Library

The CEH v11 course includes a library of the latest tools required by security practitioners and pen testers across the world.

Course Outline

Module 01	Introduction to Ethical Hacking
Module 02	Footprinting and Reconnaissance
Module 03	Scanning Networks
Module 04	Enumeration
Module 05	Vulnerability Analysis
Module 06	System Hacking
Module 07	Malware Threats
Module 08	Sniffing
Module 09	Social Engineering
Module 10	Denial-of-Service
Module 11	Session Hijacking
Module 12	Evading IDS, Firewalls, and Honeypots
Module 13	Hacking Web Servers
Module 14	Hacking Web Applications
Module 15	SQL Injection
Module 16	Hacking Wireless Networks
Module 17	Hacking Mobile Platforms
Module 18	IoT and OT Hacking
Module 19	Cloud Computing
Module 20	Cryptography

What You Will Learn ?

- Key issues include plaguing the information security world, ethical hacking, information security controls, laws, and standards.
- Perform footprinting and reconnaissance using the latest footprinting techniques and tools as a critical pre-attack phase required in ethical hacking.
- Network scanning techniques and scanning countermeasures.
- Enumeration techniques and enumeration countermeasures.
- Vulnerability analysis to identify security loopholes in the target organization's network, communication infrastructure, and end systems.
- System hacking methodology, steganography, steganalysis attacks, and covering tracks to discover system and network vulnerabilities.
- Different types of malware (Trojan, Virus, worms, etc.), system auditing for malware attacks, malware analysis, and countermeasures.
- Packet sniffing techniques to discover network vulnerabilities and countermeasures to defend sniffing.
- Social engineering techniques and how to identify theft attacks to audit human-level vulnerabilities and suggest social engineering countermeasures.
- DoS/DDoS attack techniques and tools to audit a target and DoS/DDoS countermeasures.
- Session hijacking techniques to discover network-level session management, authentication/authorization, cryptographic weaknesses, and countermeasures.
- Web server attacks and a comprehensive attack methodology to audit vulnerabilities in web server infrastructure, and countermeasures.
- Web application attacks and comprehensive web application hacking methodology to audit vulnerabilities in web applications, and countermeasures.
- SQL injection attack techniques, injection detection tools to detect SQL injection attempts, and countermeasures.
- Wireless encryption, wireless hacking methodology, wireless hacking tools, and Wi-Fi security tools.
- Mobile platform attack vector, android vulnerability exploitations, and mobile security guidelines and tools.
- Firewall, IDS and honeypot evasion techniques, evasion tools and techniques to audit a network perimeter for weaknesses, and countermeasures.
- Cloud computing concepts (Container technology, serverless computing), various threats/attacks, and security techniques and tools.
- Penetration testing, security audit, vulnerability assessment, and penetration testing roadmap.
- Threats to IoT and OT platforms and learn how to defend IoT and OT devices securely.
- Cryptography ciphers, Public Key Infrastructure (PKI), cryptography attacks, and cryptanalysis tools.

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Target Audience

- Information Security Analyst / Administrator
- Information Assurance (IA) Security Officer
- Information Security Manager / Specialist
- Information Systems Security Engineer / Manager
- Information Security Professionals / Officers
- Information Security / IT Auditors
- Risk / Threat/Vulnerability Analyst
- System Administrators
- Network Administrators and Engineers

Suggested Course Duration

Minimum Hours: 40

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Certification Course

on

Internet of Things (CCCS 02)

Offered by

School of Computer Science and Engineering

Shobhit Institute of Engineering and Technology

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Certificate Course in Internet of Things (IOT) Using Arduino

Objective of the Course:

This Course focuses on hands-on IoT concepts such as sensing, actuation and communication. It covers the development of Internet of Things (IoT) prototypes—including devices for sensing, actuation, processing, and communication—to help you develop skills and experiences. The Internet of Things (IOT) is the next wave, world is going to witness. Today we live in an era of connected devices the future is of connected things.

Learning Outcome:

After the completion of the course, the students will be able design some IOT based prototypes

Duration of the Course: 60 Hrs.

Minimum Eligibility Criteria:

Pursuing/Passed BE/B.Tech/BCA/BSc.

COURSE OUTLINE

Sr. No.	Modules to be Covered
1	Introduction to IOT
2	Simulation Environment
3	Sensor & Actuators with Raspberry Pi
4	Basic Networking with Wi-Fi module
5	IoT Protocols
6	Cloud Platforms for IOT

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Contents to be covered

Module 1

Introduction to IoT: Architectural Overview, Design Principles and needed capabilities, IoT Applications, Sensing, Actuation, Basics of Networking, M2M and IoT technology Fundamentals, Devices and Gateways, Data management, Business Processes in IoT, Everything as a Service (XaaS), Role of cloud in IoT, Security aspects in IoT

Module 2

Elements of IoT: Hardware components- Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, i/O Interfaces, Software Components-Programming API's (using Python/Node js/Arduino) for Communication Protocols-MQTT, Zigbee, Bluetooth, CoAP, UDP, TCP.

Module 3

IoT Application Development: Solution framework for IoT Applications, Implementation of device integration, Data acquisition and integration, Device data storage-Unstructured data storage on cloud/local server, Authentication, Authorization of devices.

Module 4

IoT case Studies: IoT Case studies and mini projects based on Industrial automation, Transportation, Agriculture, Healthcare, Home automation

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Certification Course

on

Intellectual Property Rights

(CCLW 01)

Offered by

School of Law and Constitutional Studies

Shobhit Institute of Engineering and Technology

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Background

Indian Law Institute (ILI) has been the pioneer in the field of teaching and training of intellectual property laws and cyber laws. After having established a sound framework for the classroom teaching in these fields, we now plan to traverse the virtual world to embark on e-education.

By e-education is meant an innovative, on-line teaching technique for distance learning that utilizes the Internet for teaching purposes. E-education would bring teachers specializing in intellectual property issues closer to students in all corners of India through virtual means. This method allows students to undertake the ILI educational programs in intellectual property at their own place anywhere in India.

The Institute would use distance learning as an alternative and a complement to traditional training methods in order to make course materials accessible to large audiences throughout India.

About the course

Development of IPR is a recent phenomenon. It is still in a nascent stage and continuously evolving every passing day. Even the most learned legal luminaries find it difficult to solve the legal problems posed by technology. The Online Certificate Course offered by the institute, intends to spread awareness among the general public about the IPR, it is specifically beneficial to the lawyer community and the judges in the subordinate judiciary, who face cases on the daily basis.

The course is designed to give distant education wherein the students need not come to the institute for either classes or examination. The course will be conducted online and the subscribers need to operate from their respective places. All the queries of the subscribers relating to the admission or the conduct will be answered online.

Teaching procedure

The Institute's initiative takes full advantage of information technology and the Internet as an alternative and a complement to traditional training programs. It offers new teaching methodologies, specially-designed course materials, evaluation tools, tailored means of delivery, and greater accessibility.

Teaching would take place in the virtual environment of the Institute's Web site. A network of tutors on the panel of ILI will be available to guide the students. Students and teachers can interact as often as necessary during the course, because communication takes place through e-mail.

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At the end of the program, successful students receive a certificate acknowledging completion of the course.

Things that would take place on-line in the course:

- Registration
- Student-teacher interaction
- Student tests and assignments
- Course monitoring
- Evaluation

Who can pursue?

It is a general course which would be of immense value to persons who fall in the following categories:

- Students
- Lawyers
- Law enforcement personnel - customs officials, police officials, etc.
- Patent agents
- Intellectual Property Offices in Government Sector
- Engineers
- Scientists
- Software Professionals
- Company Executives
- Economists
- Journalists
- Government Officials

Syllabus

The syllabus is divided in four components:

- Patents
- Copyright and neighbouring rights
- Trademarks, Geographical Indications and Domain Names
- Management of Intellectual Property Rights

Duration

40 Hrs.

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Detailed Syllabus

Objectives:

- To introduce fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.
- To disseminate knowledge on patents, patent regime in India and abroad and registration aspects
- To disseminate knowledge on copyrights and its related rights and registration aspects
- To disseminate knowledge on trademarks and registration aspects
- To disseminate knowledge on Design, Geographical Indication (GI), Plant Variety and Layout Design Protection and their registration aspects
- To aware about current trends in IPR and Govt. steps in fostering IPR

Unit 1	Intellectual Property Rights: An overview	
Introduction and the need for intellectual property right (IPR) - Kinds of Intellectual Property Rights: Patent, Copyright, Trade Mark, Design, Geographical Indication, Plant Varieties and Layout Design – Genetic Resources and Traditional Knowledge – Trade Secret - IPR in India : Genesis and development – IPR in abroad - Major International Instruments concerning Intellectual Property Rights: Paris Convention, 1883, the Berne Convention, 1886, the Universal Copyright Convention, 1952, the WIPO Convention, 1967,the Patent Co-operation Treaty, 1970, the TRIPS Agreement, 1994		
Unit 2	**Patents**	
Patents - Elements of Patentability: Novelty, Non-Obviousness (Inventive Steps), Industrial Application - Non - Patentable Subject Matter - Registration Procedure, Rights and Duties of Patentee, Assignment and licence, Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties, Patent office and Appellate Board		

Unit 3	Copyrights	
Nature of Copyright - Subject matter of copyright: original literary, dramatic, musical, artistic works; cinematograph films and sound recordings - Registration Procedure, Term of protection, Ownership of copyright, Assignment and licence of copyright - Infringement, Remedies & Penalties – Related Rights - Distinction between related rights and copyrights		
Unit 4	**Trademarks**	
Concept of Trademarks - Different kinds of marks (brand names, logos, signatures, symbols, well known marks, certification marks and service marks) - Non-Registrable Trademarks - Registration of Trademarks - Rights of holder and assignment and licensing of marks - Infringement, Remedies & Penalties - Trademarks registry and appellate board		
Unit 5	**Other types of IP**	
Design Design: meaning and concept of novel and original - Procedure for registration, effect of registration and term of protection **Geographical Indication (GI)** Geographical indication: meaning, and difference between GI and trademarks - Procedure for registration, effect of registration and term of protection **Plant Variety Protection** Plant variety protection: meaning and benefit sharing and farmers' rights – Procedure for registration, effect of registration and term of protection **Layout Design Protection** Layout Design protection: meaning – Procedure for registration, effect of registration and term of protection		
Unit 6	**Current Regime & Scenario**	
India`s New National IP Policy, 2016 – Govt. of India step towards promoting IPR – Govt. Schemes in IPR – Career Opportunities in IP - IPR in current scenario with case studies		

Course Outcomes:

- The students once they complete their academic projects, shall get an adequate knowledge on patent and copyright for their innovative research works
- During their research career, information in patent documents provide useful insight on novelty of their idea from state-of-the art search. This provides further way for developing their idea or innovations
- Pave the way for the students to catch up Intellectual Property (IP) as a career option
    a. R&D IP Counsel
    b. Government Jobs – Patent Examiner
    c. Private Jobs
    d. Patent agent and Trademark agent
    e. Entrepreneur

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Certification Course

on

Linux Fundamentals

(CCCS 01)

Offered by

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Linux Course Curriculum

Introduction to Linux

Learning Objective: In this module, you will be introduced to various features of Linux. You will learn history, open source licences, various Linux distributions and Linux installation

Topics:

- Need for Linux OS
- What is Linux
- History of Linux
- Relationship Between Unix And Linux
- Features of Linux
- False myths around Linux
- Where Linux is used?
- Components of a Linux OS
- The architecture of Linux OS
- Types of Kernel
- Shell
- Programming in Linux
- Linux Distribution
- Miscellaneous Linux Concepts
- Software Licencing
- Installation and initialisation of Linux
- Shell Scripting
- Practical Uses of Shell Scripting

Initialization of Linux

Learning Objective: In this module, you will understand the user interface, commands and tools, and file operations in Linux

Topics:

- Understand User Interface in Linux
- Implement basic Linux Commands and Tools
- vim Editor
- Advanced Linux Commands
- File System
- File System Comparisons
- File Attributes
- File Operations
- File System Characteristics
- File Access Methods
- Formatting and Partitioning
- Multiboot System
- Learn Packaging Management in Linux

Hands On/Demo:

- Linux Commands
- Vim Editor
- Creating partitions

User Administration

Learning Objective: In this module, you will learn about managing Users and perform Authentication

Configuration

Topics:

- Users in Linux
- User Configuration
- Adding/Deleting/Modifying Users
- Group Administration
- Password Aging Policies
- Switching Accounts
- Sudo
- Network Users
- Authentication Configuration
- SUID and SGID Executable
- SGID Directories
- The Sticky Bit
- Default File Permissions
- Access Control Lists (ACLs)
- Hidden Files

Hands On/Demo:

- Demo – sudo, chown and chmod
- Adding a user
- Delete user
- Modify user
- Hidden Files

Boot and Package Management

Learning Objective: In this module, you will learn about the boot management system and configuring services to run at boot. You will understand package management, which includes installing and removing software and updating a Kernel RPM.

Topics:

- Kernel Configuration
- Boot Management
- Grub Bootloader Configurations
- Red Hat Package Manager
- YUM
- DPKG
- APT
- Build from the source code
- Libraries

Hands On/Demo:

- Sysctl
- Bootloader Configurations
- Red Hat Package Manager
- YUM
- DPKG
- APT

Networking

Learning Objective: In this module, you will learn about OSI layers and various protocols of networking in Linux

Topics:

- OSI layers and Protocols: IPv4, IPv6, TCP, UDP, FTP, TFTP, Telnet, SSH, HTTP, DNS, DHCP, ARP, ICMP etc.
- Packet capturing tools
- Linux commands/tools to troubleshoot networking: netstat, tcpdump, ip, etc.
- Linux utilities: e.g. dnsmasqd, samba server ftpd, webserver, netcat, scp etc.
- Linux Firewall: command, utility and usage.
- Security: SSH, SCP. Certificates, authentication, encryption etc.
- Remote log in: SSH, screen, VNC, etc.

Hands On/Demo:

- IP addresses
- DNS
- ICMP
- dnsmasq.conf
- IP tables

Linux Overview and Scripting

Learning Objective: In this module, you will learn process management, system calls and bash operations

Topics:

- Process Management
- Process Commands
- System Calls
- Output Redirection
- Special Variables in Bash
- Expect Script

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- Python Scripting
- Dictionaries

Hands On/Demo:

- Ps command
- Top command
- Kill command
- Expect

Linux for software development

Learning Objective: In this module, you will learn about programming languages, libraries and profiling tools

Topics:

- Programming languages overview
- Static and Shared libraries
- Compilers, debugger, IDE, ctags, make utility etc.
- Editors in Linux: vi, emacs,
- Troubleshooting and optimization using profiling tools
- Diff, patch and Configuration management system
- Test automation and CI/CD pipeline

Hands On/Demo:

- Libraries
- Makefile

Security Administration, Shell Script and Virtualization

Learning Objective: In this module, we will learn about Linux security administration and Virtualization

Topics:

- Security in IT Industry
- SELinux
- Information gathering tools
- Grub security
- TCP Wrappers
- Securing Shell
- ClamAV
- Virtualization

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EDUCATION EMPOWERS

Certification Course

on

MATLAB from beginner to advance level (CCEC 02)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

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Basic Course Description

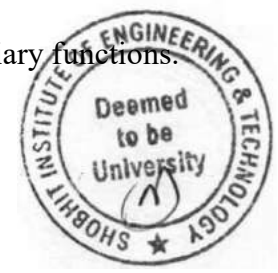
MATLAB (matrix laboratory) is one of the fundamental and leading programming languages and is a must learn skill for anyone who want to develop a career in engineering, science or related fields. Excellent **MATLAB programming skills** is therefore a crucial factor in making or breaking your career.

Duration: 40 Hrs.

This MATLAB course is one of the **most comprehensive MATLAB** courses which will take from **beginner to professional**. This course is designed from a perspective of a student who has **no prior knowledge of MATLAB and who is a MATLAB beginner.**

Throughout this comprehensive course, we cover a massive number of skills and techniques including:

- Basic mathematics and matrix manipulation functions
- Data import and visualization
- MATLAB Programming, problem solving, logic development and the use of customized functions
- Symbolic functions and variables for advance math operations
- File and directory handling
- Live scripts and sharing of results
- Advance data types including cells, tables, time tables and map containers
- Data science classification, clustering and dimensionality reduction with MATLAB
- Essential data preprocessing tasks such as outliers, missing values, categorical attributes handling
- Building regular expressions for textual processing
- Building GUIs using Guide and AppDesigner.
- Automating tasks by controlling mouse, keyboard, running scripts from command window, batch files
- Web, email and other internet related operations
- Generating ppts, word files and pdfs
- Code debugger and analyzer, exception handling, startup, finish and diary functions.



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What you'll learn

- Develop beginner to advance level skills of Programming with MATLAB. This is the only course which enables you to learn intermediate and advance programming data structures such as structures, tables, times tables, cells and map container.
- Gain Hands-On experience with MATLAB for visualizing, analyzing and formulating intermediate and some advanced level problems using MATLAB programming skills
- Experience some real-world applications of MATLAB in solving Data Science problems.

Requirements

- We cover everything from scratch and therefore do not require any prior knowledge of MATLAB
- The installation of MATLAB software on your machine is a must for this course so that you are able to run the commands and scripts that we cover during the course. If you do not have the MATLAB software installed than you may consider the following options
- 1. You may download a free trail copy of the software from the MATHWORK website. This is for limited time use
- 2. If you are student or employee, you may contact your School or employer for a free copy. Many universities offer a free student version of the software
- 3. You may consider downloading the Octave which is a free and has nearly identical functionality as that of MATLAB. (I would not recommend this option since you may not be able to have access to all the functions that we cover in this course)
- 4. If none of the above works for you, then you may purchase the student version directly from MathWorks website which is significantly lower in cost compare to its full version.

Basic Course Description

MATLAB (matrix laboratory) is one of the fundamental and leading programming language and is a must learn skill for anyone who want to develop a career in engineering, science or related fields. Excellent **MATLAB programming skills** is therefore a crucial factor in making or breaking your career.

This course is designed from a perspective of a student who has **no prior knowledge of MATLAB.** The course starts from the very basic concepts and then built on top of those basic concepts and move towards more advanced topics such as **visualization**, exporting and importing of data, **advance data types** and **data structures** and advance programming constructs.

To get the real feel of MATLAB in solving and analyzing real life problems, the course includes **machine learning topics in data science and data preprocessing.**

The course is fun and exciting, but at the same time we dive deep into MATLAB to uncover its power of formulating and analyzing real life problems. The course is structured into four different Parts. Below is the detailed outline of this course.

Part 1: MATLAB from Beginner to Advance

Segment 1.1: Handling variables and Creating Scripts

Segment 1.2: Doing Basic Mathematics in MATLAB

Segment 1.3: Operations on Matrices

Segment 1.4: Advance Math Functions with Symbolic Data Type

Segment 1.5: Interacting with MATLAB and Graphics

Segment 1.6: Importing Data into MATLAB

Segment 1.7: File Handling and Text Processing

Segment 1.8: MATLAB Programming

Segment 1.9: Sharing Your MATLAB Results

Part 2: Advance MATLAB Data Types

Segment 2.1: Cell Data Type

Segment 2.2: Tables and Time Tables

Segment 2.3: Working with Structures and Map Container Data Type

Segment 2.4: Converting between Different Data Types

Part 3: Machine Learning for Data Science Using MATLAB

Segment 3.1 Data Preprocessing

Segment 3.2. Classification

Segment 3.2.1 K-Nearest Neighbor

Segment 3.2.2 Naive Bayes

Segment 3.2.3 Decision Trees

Segment 3.2.4 Support Vector Machine

Segment 3.2.5 Discriminant Analysis

Segment 3.2.6 Ensembles

Segment 3.2.7 Performance Evaluation

Segment 3.3 Clustering

Segment 3.3.1 K-Means

Segment 3.3.2 Hierarchical Clustering

Segment 3.4 Dimensionality Reduction

Segment 3.5 Project

Part 4: Data Preprocessing for Machine Learning using MATLAB

Segment 4.1 Handing Missing Values

Segment 4.2 Dealing with Categorical Variables

Segment 4.3 Outlier Detection

Segment 4.4 Feature Scaling and Data Discretization

Segment 4.5 Selecting the Right Method for your Data

Who this course is for:

- Anyone looking to build a strong career in science or engineering through Excellent MATLAB coding skills
- Anyone wanting to advance their skills of real-world problem solving with MATLAB based scientific computing

By taking this course, you will become a **fluent** MATLAB programmer and you'll be so good so that you can get a reasonable job offer as a MATLAB developer and use the language professionally.

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Certification Course

on

Personality Development and Soft Skills (CCBS 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
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Personality Development and Soft Skills

INTENDED AUDIENCE : Students, Teachers, Professionals, Trainers, Leaders, Employers

DURATION: 40 Hrs.

INDUSTRIES APPLICABLE TO: All industries/companies/organizations will recognize and value this course and recommend this for their employees and trainee programs.

COURSE OUTLINE :

The course aims to cause a basic awareness about the significance of soft skills in professional and inter-personal communications and facilitate an all-round development of personality. Hard or technical skills help securing a basic position in one's life and career. But only soft skills can ensure a person retain it, climb further, reach a pinnacle, achieve excellence, and derive fulfilment and supreme joy. Soft skills comprise pleasant and appealing personality traits as self-confidence, positive attitude, emotional intelligence, social grace, flexibility, friendliness and effective communication skills.

COURSE PLAN :

Week 01 : Introduction: A New Approach To Learning, Planning And Goal-Setting, Human Perceptions: Understanding People, Types of Soft Skills: Self-Management Skills, Aiming For Excellence: Developing Potential And Self-Actualisation, Need Achievement And Spiritual Intelligence.

Week 02 : Conflict Resolution Skills: Seeking Win-Win Solution, Inter-Personal Conflicts: Two Examples, Two Solutions, Types of Conflicts: Becoming A Conflict Resolution Expert, Types of Stress: Self-Awareness About Stress, Regulating Stress: Making The Best out of Stress.

Week 03 : Habits: Guiding Principles, Identifying Good And Bad Habits, Habit Cycle; Breaking Bad Habits, Using The Zeigarnik Effect For Productivity And Personal Growth, Forming Habits of Success.

Week 04 : Communication: Significance Of Listening, Active Listening, Barriers To Active Listening; Telephone Communication: Basic Telephone Skills, Advanced Telephone Skills, Essential Telephone Skills.

Week 05 : Technology And Communication: Technological Personality?, Mobile Personality?, E-Mail Principles, How Not To Send E-Mails!, Netiquette, E-Mail Etiquette.

Week 06 : Communication Skills: Effective Communication, Arising Out Of Sender/Receiver's Personality; Barriers To Communication: Interpersonal Transactions, Miscommunication; Non-Verbal Communication: Pre-Thinking Assessment-1 & 2.

Week 07 : Nonverbal Communication: Introduction And Importance, Issues And Types, Basics And Universals, Interpreting Non-Verbal Cues; Body Language: For Interviews, For Group Discussions.

Week 08 : Presentation Skills: Overcoming Fear, Becoming A Professional, The Role Of Body Language, Using Visuals, Reading Skills: Effective Reading, Human Relations: Developing Trust And Integrity.

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Certification Course

on

Retail Management (CCBS 03)

Offered by

School of Business Studies

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Retail Management

Certification Code

This integrated certificate course in retail management, concentrates on the Retail sector's emerging and the most prevalent trends. The Retail world's most crucial aspects like Category Management, Retail Buying, Store Operations, Customer Marketing and Retail Strategies have been rightly explored. This may help individuals embark on a career in one of the many roles in the Retail industry.

Why should one take this certification?

This Course is intended for professionals and graduates wanting to excel in their chosen areas. It is also well suited for those who are already working and would like to take certification for further career progression.

Earning Vskills Retail Management Professional Certification can help candidate differentiate in today's competitive job market, broaden their employment opportunities by displaying their advanced skills, and result in higher earning potential.

Who will benefit from taking this certification?

Job seekers looking to find employment in retail departments of various companies, students generally wanting to improve their skill set and make their CV stronger and existing employees looking for a better role can prove their employers the value of their skills through this certification.

Course Duration

30 Hrs.

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Table of Contents

7. The Demand-Driven Supply Chain

7.1 Vision for The Demand-Driven Supply Chain
7.2 The Path From Forecast-Driven To Demand-Driven Supply Chain
7.3 Demand-Driven Tools And Techniques
7.4 Sponsoring The Demand-Driven Supply Chain

8. Product Tracking Along Retail Supply Chains

8.1 Introduction
8.2 Low Tech Retailing
8.3 Beyond Basic Bar Codes
8.4 Radio Frequency Identification
8.5 Tracking In Transit
8.6 The Future Of Product Tracking

9. Understanding Supply Chain Costs

9.1 Introduction
9.2 Barriers To Cost Visibility
9.3 Goal: Activity-Based Costing By Product
9.4 The Starting Point (i-a)
9.5 Department Costs With Capital Recovery (ii-b)
9.6 Multicompany Process Cost (iii-c)
9.7 Activity-Based Costs By Product (iv-d)
9.8 Understanding costs—summary

10. Retail Return

10.1 Introduction
10.2 Genco Case Study—The Rise Of The Return Loop
10.3 Types of Returns
10.4 Opportunities In Returns

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Certification Course

on

Solar Power Technology

(CCEE 01)

Offered by

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(Deemed to-Be University)
NH-58, Modipuram, Meerut-250110

SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

SOLAR POWER TECHNOLOGY

PRE-REQUISITES : Basic knowledge of heat transfer, thermodynamics and fundamentals of physics

COURSE DURATION: 35 Hrs.

INTENDED AUDIENCE : UG, PG and Doctorate students

INDUSTRIES APPLICABLE TO : This course will be very much effective for the engineers working in the Solar Industries

COURSE OUTLINE :

The course content is designed to provide comprehensive knowledge on solar radiation, analysis of solar radiation data, fundamentals of the solar thermal and photovoltaic system along with storage of energy required for effective design of efficient solar energy conversion devices. The concepts will be illustrated with practical examples, schematics and block diagrams wherever required. A sufficient number of numerical problems with solutions will be discussed in the course. This course is specifically designed for undergraduate and postgraduate students of Energy Engineering and Technology. Further, the course will be very much useful for students and researchers from varied academic backgrounds for the synthesis of novel energy conversion devices and processes.

COURSE PLAN :

Week 1: Energy Scenario, overview of solar energy conversion devices and applications, physics of propagation of solar radiation from the sun to earth.

Week 2: Sun-Earth Geometry, Extra-Terrestrial and Terrestrial Radiation, Solar energy measuring instruments

Week 3: Estimation of solar radiation under different climatic conditions, Estimation of total radiation

Week 4: Fundamentals of solar PV cells, principles and performance analysis, modules, arrays, theoretical maximum power generation from PV cells

Week 5: PV standalone system components, Standalone PV-system design.

Week 6: Components of grid-connected PV system, solar power plant design and performance analysis.

Week 7: Fundamentals of solar collectors, Snails law, Bougers law, Physical significance of Transmissivity - absorptivity product.

Week 8: Performance analysis of Liquid flat plate collectors and testing

Week 9: Performance analysis of Solar Air heaters and testing

Week 10: Solar thermal power generation (Solar concentrators).

Week 11: Thermal Energy Storage (sensible, latent and thermo-chemical) and solar pond

Week 12: Applications: Solar Refrigeration, Passive architecture, solar distillation, and emerging technologies.

Shobhit
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EDUCATION EMPOWERS

Career Building Symposium

Date:
20 Nov.
to
02 Dec. 2018

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

University Training and Development Cell

Shobhit Institute of Engineering & Technology, Meerut

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Shobhit
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EDUCATION EMPOWERS

Skill Development Program

Date:
6 Aug.
to
23 Aug. 2018

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

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Shobhit
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EDUCATION EMPOWERS

Workshop on on Millionair Mindset and Entreprenureship

Date:
11 Feb.
to
27 Feb. 2019

Venue:
University Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

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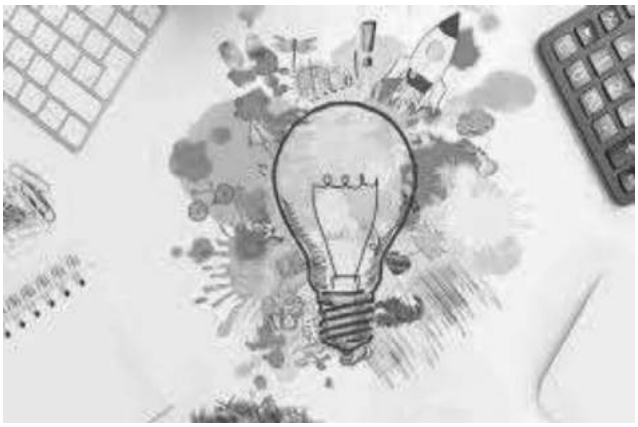
EDUCATION EMPOWERS

Workshop on on Entreprenureship Development

Date:
04 March
to
20 March
2019



Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

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EDUCATION EMPOWERS

Workshop on
on
Signal Processing System

Date:
05 Nov.
to
21 Nov
2018

Venue:
Electronic Lab

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Electronics and Communication Enginnering

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EDUCATION EMPOWERS

School of Business Studies invites you for

workshop On

Soft Skills

Date
04 March
to
19 March
2019

Time
11:00 am
to
2:00 pm

Registrar
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EDUCATION EMPOWERS

A Specialized Course on on Basic Mathematics, Physics and Chemistry for Competitive Exams

Date:
18 Aug 2018.
to
18 May
2019

Venue:
Seminar Hall,
NMC

Time:
Every
Saturday 2:00
PM to 3:00 PM

Organized by

School of Basic & Applied Science

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Shobhit
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EDUCATION EMPOWERS

A Training Program on Yoga

Date:
03 Sept
to
19 Sept
2018

Venue:
University Ground

Time:
7:00 am to 9:00 am

Organized by

School of Business Studies

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EDUCATION EMPOWERS

A Training Program
on
Innovation, Leadership & Motivation

Date:
22 Oct
to
30 Oct
2018

Venue:
University
Auditorium

Time:
1:00 pm to
5:00 pm

Organized by

School of Engineering and Technology

&

School of Baisc and Applied Science

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Shobhit
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EDUCATION EMPOWERS

Workshop on
on
Website Designing using HTML

Date:
01 July
to
10 July
2019

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

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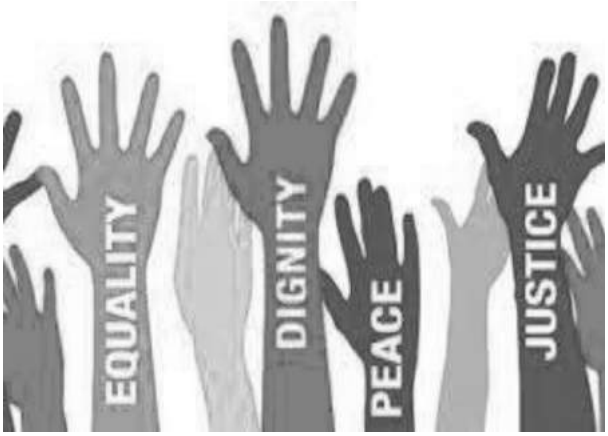
EDUCATION EMPOWERS

A Program
on
Human Rights International Law & International Humanitarian Law

Date:
15 Oct
to
31 Oct
2018



Venue:
Moot Court

Time:
3:00 pm to
5:00 pm

Organized by

School of Law & Constitutional Studies

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Shobhit
Institute of Engineering & Technology
Deemed to-be-University

EDUCATION EMPOWERS

A Program on Detection, Diagnosis and Plant Disease

Date:
15 Oct
to
31 Oct
2018

Venue:

TBI

Time:
3:00 pm to
5:00 pm

Organized by

Department of Agriculture & Agriinformatics

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EDUCATION EMPOWERS

Certification Course

on

Acoustical Physics of Music

(CCAS 01)

Offered by

School of Basic and Applied Sciences

Shobhit Institute of Engineering and Technology

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

Acoustical Physics of Music

Prerequisites: None

Course Objective: To provide a fundamental physical understanding of the nature of sound, hearing, and music.

Course Duration: 40 Hrs.

Course Description:
We will begin to explore increasingly intricate aspects of how simple waves are combine in extremely precise ways to create the complex sounds we experience in everyday life, with a focus on how our perception of these sounds works, how the phenomenon of music arises, how certain instruments create their own unique versions of it, and how music is recorded and/or presented to an audience. We understand that most of you are not majors in science or engineering, so some of the technical concepts will be new to you.

Unit 1. Oscillations, Waves and Sound

Simple harmonic oscillations. Amplitude, period, and frequency (pitch). Harmonic oscillations with slowly changing parameters. Perception of sound. Combinations of harmonic oscillations. Beats. Phase relations and psychoacoustical Ohm's law, phase beats. Damped and driven oscillations, resonance. Periodic waves, solitary waves, wave packets. Wave length, sound velocity. Spherical and cylindrical waves. Longitudinal and transverse waves. Surface acoustic waves. Reflection and refraction of waves. Refraction of sound in the atmosphere. Doppler effect. Sonic booms and shock waves.

Unit 2. Standing Waves and Overtone Series

Standing waves in general. Role of boundary conditions in the formation of standing waves. Node-node, antinode-antinode, and node-antinode boundary conditions. Overtone's series. Mersenne's laws. Analysis and Synthesis of Complex Waves: Synthesis of complex waves. Fourier analysis and Fourier spectra. Analysis of tone quality: Attacks and decays, formants. Vibrato and tremolo. Discrete and continuous Fourier spectra. Spectrograms: Narrow-band and wide-band.

Unit 3. Hearing, Speech and singing

Transmission of the signal through the ear parts. Place theory of hearing: Frequency response and frequency resolution. amplitude and the intensity of the sound. neurophysiology of the hearing process. Sensitivity of the ear to the sound intensity. The decibel scale of sound

intensity level. Nonlinearity of the ear. Aural harmonics. Combinational tones. Fundamental tracking. Cochlear implants as a confirmation of the place theory of hearing. Structure of speech and singing apparatus. Throat and mouth as a resonator. Naive open-closed-pipe theory of the throat-mouth resonator. Resonances as formants in shaping the output sound. Production of the glottal wave by the vocal folds, Bernoulli law. Difference between singing, speech, and hoarse speech. Simplified two-formant synthesis of vowels.

Unit 4. Room and auditorium acoustics

Direct and reflected sound. Texture of the echo. Definition of the reverberation time. Fullness and clarity. Warmth and brilliance. Formula for the reverberation time. Absorption and reflection coefficients. Resonances in room of a box. shape. General principles of constructing concert halls. architectural acoustics and the science of reverberation, Sabine equation. Basic parameters, design and modification of spaces using different types of absorbers and treatments. Active methods of noise reduction and room treatment (e.g., phantom acoustic shadows). Diffusion through reflection-phase gratings (quadratic-residue and primitive-root diffusers). Helmholtz resonators. Room dimensions.

Unit 5. Equipment used for recording music

Microphones and preamplifiers, analog (tape and records) and digital formats for recording. **Home playback and reproduction of music** – general categorization of mass-Fi, mid-Fi and HiFi qualities and philosophies. Sources (tape, record, CD, DVD-audio, SACD, etc.), preamplifiers (tubes and solid-state, chips vs discrete), amplifiers, speakers (dynamic, electrostatic, planar magnetic, etc.). Room choice and placement of components. Wiring and interfacing (concept of impedance mismatch and mechanical and dielectric degradation). **Working of some acoustical and electronic musical instruments** – electric guitar and its effects, etc.

Learning outcomes: At the end of this course students will be able to

1. Understand how a harmonic oscillator works and the concepts of resonance and formants.
2. Understand the concepts and interrelationships between wavelength, frequency, and speed of a wave.
3. Understand the origin of harmonics in string and wind instruments.
4. Understand the concepts of loudness, intensity levels and decibels.
5. Understand some basics of the neurophysiology of the hearing process and the causes of hearing loss.
6. Understand tones and the basic of musical scales.

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EDUCATION EMPOWERS

Certification Course

on

Automotive Technology Level 1

(CCME 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

Course Descriptions and Outlines

Automotive Technology

Level 1

Course Description

Duration: 60 Hrs.

Term: 3 Hours per day

Prerequisite: none

Description: This is the study of an automobile. There will be a hands-on experience class involving activities that relate directly to maintenance, repair and service. The program of instruction may include: safety in the shop, care and use of tools, interpretation of parts books, parts handling, engine construction, ignition systems, fuel systems, charging systems, starting systems, electronic systems, chassis wiring and diagrams, brakes, lubrications and minor tune-up. Students may be involved in BMW Skill Next Program.

Course Outline

Orientation	Introduce Develop Master
A. Occupational outlook	I
B. Places that employ auto mechanics	I
C. Student requirements for the auto mechanics program	I/D
D. Steps involved in automotive shop work	I/D
E. Skills USA	I
F. Ways Skills USA state and national dues are used	I
G. Mandan automotive program rules	I/D
H. MSDA	I/D
I. Personal information sheet	I/D/M
J. Follow instructions sheet	I/D/M
K. Job application form	I/D/M

Safety	
I. Safety	
A. Terms related to the unit	I/D/M
B. Colors and application of the safety color code	I/D/M
C. Personal safety rules	I/D/M
D. General shop safety rules	I/D/M
E. Safety rules involving hand tools	I/D/M
F. Safety rules involving the engine	I/D/M
G. Battery safety	I/D/M
H. Safety rules involving flammable liquids	I/D/M
I. Equipment safety rules	I/D/M
J. Components of the fire triangle	I/D/M
K. Classes of fire	I/D/M
L. Types of fire extinguishers	I/D/M
II. Machine Safety Rules	
A. Parts washer	I/D/M
B. Engine hoist	I/D/M
C. Grinder	I/D/M
D. Hydraulic press	I/D/M
E. Drill press	I/D/M
F. Hoist	I/D/M
G. Floor jack	I/D/M
H. Pressure washer	I/D/M
III. Automotive lift	
A. Safety tips	I/D/M
B. Safety pledge form	I/D/M
IV. Safety Review	
A. Individual Student Shop Safety Inspection Form	I/D/M
Hand Tools	
A. Purpose of hand tools & storage	I/D/M
B. Types of screwdrivers	I/D/M
C. Types of pliers	I/D/M
D. Types of wrenches	I/D/M
E. Components of a socket set	I/D/M

F. Types of sockets	I/D/M
G. Special purpose sockets	I/D/M
H. Types of hammers used in the auto shop	I/D/M
I. Types of punches	I/D/M
J. Types of chisels	I/D/M
K. Types of files	I/D/M
L. Types of file teeth	I/D/M
M. Types of parts cleaning tools	I/D/M
N. General shop tools	I/D/M
O. Battery service tools	I/D/M
P. Starter service tools	I/D/M
Q. Charging system service tools	I/D/M
R. Ignition service tools	I/D/M
S. Fuel system service tools	I/D/M
T. Exhaust system service tools	I/D/M
U. Cooling system service tools	I/D/M
V. Lubrication service tools	I/D/M
W. Brake service tools	I/D/M
X. Front-end service tools	I/D/M
Y. Engine repair tools	I/D/M
Z. Drive line service tools	I/D/M
AA. General Torque Specification Chart	I
Rules and Measures	
I. Rules	
A. Terms related to the unit	I
B. Basic units of measurement	I/D
C. Fractional units found on rules	I/D
D. Decimal units found on rules	I/D
E. Metric units found on rules	I/D
F. Rules used in shop work	I
G. Uses of the rule with accessories	I
H. Procedure for using rules	I/D
I. Steps for reading the rules	I/D
II. Outside micrometer	
A. Types of measurements found on the outside micrometer	I/D/M
B. Major parts of the outside micrometer	I
C. Steps in selecting the proper size outside micrometer	I/D/M

D. General rules for use and care of micrometers	I/D
E. Definition of "feel" when using a micrometer	I/D
F. Methods of checking accuracy of outside micrometers	I/D/M
G. Reading the plane micrometer	I/D/M
H. Reading the vernier micrometer	I/D/M
Service Manuals	
A. Car information section	I/D/M
B. General service information section	I/D/M
C. Carline unit index	I/D/M
D. Specification sheets	I/D/M
E. Repair information section	I/D/M
F. Labor and parts guide	I/D/M
G. Repair order	I/D/M
Electrical Unit	
I. Basic electrical theory	
A. Terms related to basic electricity	I
B. Parts of the atom and their values	I
C. Electricity according to the electron theory	I
D. Basic factors of electrical flow in a circuit	I
E. Relationship of voltage, amperage, and ohms to current flow	I/D
F. Ohms Law	I/D/M
G. Calculating problems using Ohms Law	I/D/M
H. Factors effecting resistance in a conductor	I/D
I. Basic electrical symbols	I/D/M
J. Components of a basic electrical circuit	I/D/M
K. Types of electrical circuits	I/D/M
L. Instruments for testing electrical circuits	I/D/M
M. Methods of connecting test instruments	I/D/M
N. Basic electrical circuit failures	I/D
O. Characteristics of magnetism	I/D
P. Characteristics of electromagnetism	I/D
Q. Electromagnetic induction	I/D
R. Factors determining magnitude of induce voltage	I/D

II. Battery service	
A. Terms related to the battery	I
B. Functions of a battery	I/D
C. Purposes of the battery parts	I/D
D. Converting chemical energy into electrical energy	I/D
E. Factors affecting battery voltage and capacity	I/D
F. Battery capacity in amperes	I/D
G. Types of battery rating	I/D
H. Safety rules	I/D/M
I. Features of a service-free battery	I
J. Jump starting a vehicle	I/D
III. Charging system	
A. Purpose of the charging system	I/D
B. Terms related to the charging system	I
C. Charging system components	I
D. Parts of the generator	I
E. Parts of the alternator	I/D/M
F. Differences between an alternator and generator	I/D
G. Advantages of a alternator over a generator	I/D
H. Reason an alternator produces more current at low speed than a generator	I/D
I. Stator construction	I/D
J. Types of stator windings	I/D
K. Current and voltage regulation in an alternator	I/D
L. Types of voltage regulators for alternators	I/D
M. Troubleshooting the charging system	I/D/M
IV. Starting system	
A. Terms related to the starting system	I/D
B. Purpose of the starting system	I/D
C. Operating principle of the starter	I
D. Magnetic principles of the starter	I
E. Path of current flow in a series wound starter	I
F. Components of the starting system	I/D
G. Types of starter switches	I/D
H. Parts of the starter	I/D/M
I. Major parts of the gear reduction starter	I/D/M
J. Types of starter drives	I/D
K. Components of a starter control circuit	I/D
L. Starting system control circuit components and their functions	I/D
M. Troubleshooting the starting system	I/D/M

V. Ignition system	
A. Terms related to the ignition system	I/D
B. Purpose of the ignition system	I/D
C. Components of the ignition system	I/D
D. Function of the ignition system components	I/D
E. Distributor components	I/D/M
F. Components of the ignition system circuits	I/D
G. Operation of the ignition system	I/D
H. Parts of the spark plug	I
I. Spark plug heat ranges	I
J. Spark plug conditions and their causes	I/D/M
K. Types of secondary ignition cables	I/D
L. Transistorized and capacitive discharge ignition system	I
M. Relationship of the electronic ignition system to the conventional ignition system	I/D
N. Advantages of the electronic ignition system	I/D
O. Major components of the electronic ignition system	I/D/M
P. Function of the components of the electronic ignition system	I/D
Q. Operation of the electronic ignitions system	I/D
VI. Chassis wiring	
A. Terms related to chassis wiring	I
B. Electrical symbols	I/D
C. Types of electrical terminals and connectors	I/D
D. Types of bulbs used in automobiles	I
E. Parts of the sealed beam	I
F. Differences between hot and ground circuits	I/D
G. Facts about voltage drop	I/D/M
H. Facts about current draw	I/D/M
I. Single and two-wire circuits	I/D
J. Instruments used in testing automobile electrical circuits	I/D/M
K. Steps in diagnosis of an electrical problem	I/D/M
L. Characteristics of a wiring diagram	I/D/M
M. Parts of a typical circuit identification code	I/D/M
Brake Unit	
I. Wheel bearings	
A. Terms related to unit	I/D
B. Types of front wheel bearings	I/D/M
C. Parts of a tapered roller front wheel bearing assembly	I/D/M

D. Characteristics of quality wheel bearing grease	I
E. Precautions to observe while packing wheel bearings	I/D/M
II. Brake systems	
A. Purpose of the brake system	I/D
B. Terms related to unit	I/D
C. Components of the standard brake system	I/D/M
D. Components of the tandem or dual brake system	I/D/M
E. Parts of a standard master cylinder	I/D/M
F. Parts of a tandem master cylinder	I/D/M
G. Parts of a wheel cylinder	I/D/M
H. Parts of a standard brake assembly	I/D/M
I. Types of self-adjusting brake systems	I/D
J. Brake operation	I/D/M
III. Power disc brakes	
A. Terms related to unit	I/D
B. Major components of the disc brake system	I/D
C. Disc brake components and their functions	I/D
D. Types of disc brake calipers	I
E. Parts of a floating caliper disc brake	I/D/M
F. Characteristics of disc brakes	I
G. Reasons disc brakes may require power booster units	I/D
H. Sources of energy used for power boosters	I
I. Types of vacuum operated power boosters	I/D
J. Major parts of a vacuum operated power booster	I
K. Major parts of a hydro-boost power booster	I
L. Operation of the vacuum suspended power booster	I/D/M
M. Operation of the atmospheric suspended power booster	I/D/M
N. Operation of the hydro-boost power booster	I/D/M
O. Requirements of super heavy-duty brake fluid	I
P. Conditions that are considered normal and are not indications that the master cylinder needs service	I/D/M
Q. Parts of a parking brake system on four wheel disc brakes	I
IV. Anti-lock brake system	
A. Safety precautions	I/D/M
B. Lug nut torque specifications	I/D/M
C. Description	I
D. Operation	I
E. Diagnosis and testing	I/D
F. Note on intermittents	I

G. Depressurizing the system	I/D
H. Component removal and installation	I
J. Wheel sensor air gap	I
K. Bleeding brake system	I/D/M
L. Reading wiring diagrams	I/D
M. Pin-out checks	I

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Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

Certification Course

on

Automotive Technology Level 2

(CCME 02)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

Registrar
Shobhit Institute of Engg. & Tech.
(Deemed to-Be University)
NH-58, Modipuram, Meerut-250110

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Automotive Technology

Level 2

Course Description

Duration: 60 Hrs.

Term: 3 Hours per day

Prerequisite: Automotive Technology Level 1

Description: This is a continuation of the Automotive Technology Level 1 course with more advanced training and more skill required in the use of tools and equipment. This course is designed to give the students the opportunity to learn practical application along with the related material in the following areas: engine rebuilding, transmissions, clutch, drive train, differentials, major tune-up, and electronic emission control systems. The students may be involved in the BMW Skill Next Program.

Course Outline

Engine Repair	Introduce Develop Master
I. Basic Engine Principles	
A. Terms related to the unit	I
B. Characteristics of energy	I
C. Types of energy	I
D. Forms of available energy	I
E. Types of motion	I
F. Simple machines	I
G. Uses of simple machines	I
H. Calculating work	I/D
I. Calculating horsepower	I/D
J. Formula for torque	I/D
K. Characteristic of heat engines	I
L. Types of heat engines	I
M. Parts of basic internal combustion engine	I/D

N. Process for converting chemical energy into rotary motion	I
O. Operation of four-stroke cycle engine	I/D/M
P. Valve timing and overlap	I/D
Q. Operation of two-stroke cycle engine	I/D
R. Formula for cubic inch displacement	I/D
S. Results of increasing compression ratio	I/D
T. Components of an automobile engine	I/D
U. Gasoline and diesel engines	I
V. Purpose of a heavy flywheel	I
II. Engine Condition Evaluation	
A. Terms related to unit	I
B. Conditions causing low oil pressure	I/D
C. Conditions that cause oil consumption	I/D
D. Items to inspect for engine condition evaluation	I/D/M
E. Items to check prior to testing for internal engine noise	I/D/M
F. Internal engine noise diagnosis	I/D/M
III. Engine Removal	
A. Terms related to unit	I
B. Safety precautions to observe while removing an engine	I/D/M
IV. Engine Disassembly	
A. Terms related to unit	I/D
B. Safety precautions to observe during engine disassembly	I/D/M
C. Factors to consider when preparing to disassemble an engine	I/D
D. Items to inspect during engine assembly	I/D/M
V. Valve Train and Cylinder Head Reconditioning	
A. Terms related to unit	I/D
B. Purpose of the valve train	I
C. Parts of the valve train	I/D
D. Function of valve train parts	I/D
E. Camshaft locations	I
F. Methods of driving the camshaft	I/D
G. Parts of the camshaft	I/D
H. Parts of the cam lobe	I/D/M
I. Types of valve lifters	I/D/M
J. Parts of a hydraulic valve lifter	I/D/M
K. Operation of a hydraulic valve lifter	I/D
L. Parts of the valve	I/D/M
M. Parts of a valve assembly	I/D/M
N. Types of valve springs and dampering devices	I/D/M

O. Types of valve stem seals	I/D/M
P. Types of valve spring keepers	I/D/M
Q. Purpose of valve spring spacer	I/D
R. Types of valve rotators	I/D
S. Purpose of valve rotator	I/D
T. Reasons a valve must seat properly	I/D/M
U. Causes of valve burning	I/D/M
V. Tools of valve reconditioning	I/D/M
VI. Engine Crankshaft, Bearings and Oil Pump	
A. Terms related to unit	I
B. Purpose of the crankshaft	I/D
C. Parts of the crankshaft	I/D
D. Methods used to manufacture crankshafts	I
E. Types of bearing used on the cam and crankshaft	I/D
F. Construction of an insert bearing	I
G. Bearing spread and crush	I/D
H. Bearing requirements	I/D
I. Causes of bearing failure	I/D/M
J. Action of lubricating oil in an insert bearing	I/D
K. Purpose of torsional vibration damper and flywheel	I
L. Types of rear main bearing oil seals	I/D
M. Types of oil pumps	I/D
N. Parts of an oil pump	I/D
O. Conditions that could lower oil pressure	I/D/M
VII. Cylinder and Piston Reconditioning	
A. Terms related to unit	I
B. Cylinder wear patterns	I/D
C. Methods of reconditioning cylinders	I/D/M
D. Types of cylinder sleeves	I
E. Reasons cylinders wear tapered	I/D
F. Parts of the cylinder block	I/D
G. Types of cylinder block core hole plugs	I/D
H. Parts of a piston and connecting rod assembly	I/D
I. Types of compression rings	I/D
J. Methods of installing compression rings	I/D/M
K. Types of oil rings	I/D
L. Methods of installing oil rings	I/D/M
M. Methods of heat and expansion control in the piston	I
N. Piston conditions and related causes	I/D/M

O. Lubrication of cylinder walls and piston pins	I/D
P. Tools and equipment used in reconditioning cylinders and pistons	I/D/M
Q. Types of piston pin locks	I/D
VIII. Engine Reassembly	
A. Terms related to unit	I
B. Tools used in engine reassembly	I/D/M
C. Reasons for torqueing bolts to specifications in an engine	I/D/M
IX. Engine Installation	
A. Terms related to unit	I
B. Safety precautions to observe during engine installation	I/D/M
C. Factors to consider when installing an engine	I/D/M
D. Items to check or adjust before starting a new or rebuilt engine	I/D/M
E. Break-in procedure	I/D/M
X. Cooling System	
A. Purpose of the cooling system	I/D
B. Terms related to unit	I
C. Types of thermostats	I/D
D. Thermostat operation	I/D/M
E. Job performed by the cooling system	I/D
F. Downflow and crossflow radiators	I
G. Methods of cooling the internal combustion engine	I/D
H. Types of radiator hoses	I/D
I. Pressure cap operation at various temperatures	I/D/M
J. Variable-speed fan drive operations	I/D/M
K. Reasons for using permanent antifreeze solution	I/D
L. Operation of the coolant recovery system	I/D
M. Belt tension	I/D/M
N. Belt inspection	I/D/M
XI. Engine Lubrication System	
A. Terms related to unit	I
B. Purpose of the engine lubrication system	I
C. Components of the engine lubrication system	I/D
D. Purposes of the components of the engine lubrication system	I/D
E. Types of oil filters	I/D
F. Engine oil classifications	I
G. Oil viscosity classifications	I
H. Oil service designation letters and their descriptions	I
I. Points to consider when selecting engine oil	I/D
J. Additives found in engine oil	I

XII. Exhaust System	
A. Purpose of the exhaust system	I
B. Terms related to unit	I
C. Types of mufflers	I
D. Operation of the manifold heat control valve	I
E. Construction and operation of catalytic converter	I
F. Tools for exhaust system service	I
G. Types of exhaust systems	I
H. Prevention of carbon monoxide poisoning	I/D
I. Causes of corrosion of exhaust system	I
J. Basic components of the exhaust gas recirculating system	I
K. Purpose of exhaust gas recirculating system	I
XIII. Fuel System	
A. Purpose of the fuel system	I
B. Terms related to unit	I
C. Components of the fuel system and their purposes	I
D. Fuel pump operation	I
E. Types of fuel filters	I
F. Types of air cleaners	I
G. Parts of the carburetor	I
H. Carburetor systems and their uses	I
I. Gasoline additives and their purposes	I
J. Fuel injection	I
K. Variations of fuel injection systems	I
Manual Drive Train	
I. Clutch Assembly	
A. Terms related to the unit	I
B. Components of the clutch assembly	I/D
C. Parts of a clutch disc	I
D. Types of pressure plates	I/D
E. Clutch operation	I/D
F. Methods used to actuate clutch release	I
G. Mechanisms that allow smooth clutch engagement	I
H. Conditions to look for during clutch inspection	I/D/M
I. Symptoms that may occur when a clutch housing bore has excessive run-out	I
J. Clutch malfunctions and probable causes	I/D/M
K. Problems not requiring clutch removal	I/D/M

L. Clutch problems requiring clutch removal	I/D/M
II. Standard Transmission	
A. Purpose of the transmission	I
B. Terms related to the unit	I
C. Parts of the transmission	I/D/M
D. Parts of a synchronizer	I/D/M
E. Types of gear teeth	I/D/M
F. Three-speed synchromesh transmission operation	I/D/M
G. Gear operation of a three-speed transmission	I/D/M
H. Basic types of overdrives	I
I. Major parts of the electrically operated overdrive	I
J. Operation of the electrically operated overdrive	I
K. Procedure for performance testing shift linkage adjustment	I/D/M
L. Procedure for performance testing the manual transmission	I/D/M
III. Drive Lines	
A. Terms related to the unit	I
B. Types of drive lines	I
C. Components of a propeller shaft	I
D. Types of U-joints	I
E. Parts of a cross and roller or cardan U-joint	I/D/M
F. Parts of a ball and trunnion U-joint	I
H. Parts of a constant velocity U-joint	I/D/M
I. Acceleration-deceleration of propeller shaft equipped with a cross and roller U-joint	I
J. Major components of a four wheel drive	I
K. Tools used in drive line repair	I
L. Methods of controlling drive line vibration	I
IV. Rear Axle	
A. Purpose of the rear axle assembly	I
B. Terms related to the unit	I
C. Parts of a gear tooth	I/D/M
D. Parts of a conventional differential	I/D/M
E. Parts of the planetary differential	I/D/M
F. Types of differential carrier housings	I/D
G. Ring gear and drive pinion tooth contact pattern	I/D/M
H. Gear tooth contact patterns	I/D/M
I. Types of rear axle shafts	I/D
J. Types of rear axle bearings	I/D
V. Automatic Transmission Service	
A. Terms related to the unit	I

B. Repairs which can be performed with the transmission in the vehicle	I
C. Items to include in a automatic transmission tune-up	I
D. Tests that are performed while transmission is in the vehicle	I/D
E. Types of automatic transmission fluids and their applications	I/D/M
F. Procedure for properly checking transmission fluid level	I/D/M
G. Fluid conditions and possible transmission problems	I/D
H. Types of transmission filters	I
VI. Manual Transaxle Operation	
A. Terms related to the unit	I
B. Transaxle components and how they function	I/D/M
C. Transaxle operation	I/D
VII. Manual Transaxle Diagnosis	
A. The operation and design	I/D/M
B. Half shaft diagnosis	I/D/M
VIII. Transaxle Removal and Disassembly	
A. Safety in transaxle removal	I/D/M
B. Procedure for removing the transaxle	I/D
C. Transaxle disassembly	I/D/M
IX. Transaxle Cleaning, Inspection and Assembly	
A. Procedure for cleaning and inspecting transaxle components	I/D/M
B. Clutch inspection	I/D/M
C. Procedure for reassembling and adjusting the transaxle	I/D/M
D. Half shaft repair procedures	I/D/M
X. Transaxle Installation and Performance Testing	
A. Transaxle installation	I/D
B. Procedures for performance testing the transaxle	I/D
XI. Four-Wheel-Drive Components and Operation	
A. Terms related to the unit	I
B. Four-wheel-drive components and functions	I
C. Driveline operation	I
XII. Four-Wheel-Drive Diagnosis and Repair	
A. Safety in four-wheel-drive diagnosis and repair	I/D/M
B. Procedures for diagnosing a four-wheel-drive vehicle	I
C. Repair procedures for locking hubs	I
D. Procedure for removing the front differential assembly	I
E. Repair procedures for front spindals	I
XIII. Transfer Case Components and How They Function	
A. Transfer case components and their functions	I
B. Transfer case operation	I

XIV. Transfer Case Diagnosis and Removal	
A. Transfer case diagnosis	I
B. Safety in transfer case removal	I/D/M
C. Procedures for removing the transfer case	I
XV. Transfer Case Disassembly, Cleaning, Adjustment and Reassembly	
A. Procedure for disassembly of the transfer case	I
B. Procedure for cleaning and inspecting the transfer case	I
C. Transfer case end-play and torque measurements	I
D. Procedure for reassembly of the transfer case	I
XVI. Transfer Case Installation and Performance Testing	
A. Transfer case installation	I
B. Procedure for performance testing and transfer case	I

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EDUCATION EMPOWERS

Certification Course

on

Biomechatronics (CCBM 01)

Offered by

School of Biomedical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

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Bio-Mechatronics

About Bio-Mechatronics:

Bio-Mechatronics is an applied interdisciplinary science that aims to integrate biology and mechatronics (electrical, electronics and mechanical engineering).

It also encompasses the fields of robotics and neuroscience. Biomechatronic devices encompass a wide range of applications from the development of prosthetic limbs to engineering solutions concerning respiration, vision, and the cardiovascular system.

Bio-Mechatronics is the integration of biological components with artificial devices, in which the biological component confers a significant functional capability to the system, and the artificial component provides specific cellular and tissue interfaces that promote the maintenance and functional adaptation of the biological component. Based upon functional performance, muscle is potentially an excellent mechanical actuator, but the larger challenge of developing muscle-actuated, biomechatronic devices poses many scientific and engineering challenges.

Course Duration: 30 Hrs.

Detailed Syllabus

Pre-requisites: Knowledge of Materials and their properties used in Manufacturing process Basic Knowledge of Electrical, Electronics, Mechanics and Biology.

Course Outcomes: At the end of the course, the student will be able to:

CO1	Explain the motivation, ethical issues and future challenges in bio-mechatronics.
CO2	Analyze the design and construction of biomechatronic technologies.
CO3	Evaluate the design and construction of biomechatronic technologies.
CO4	Apply appropriate dynamic models and computational tools to simulate and analyze biomechatronic systems.
CO5	Design simple biomechatronic systems using appropriate hardware instrumentation and end user.

Course Contents

Module 1 Introduction to Bio-mechatronics: clinical examples, highlights of technology, ethical issues and course outline. Nervous and muscular systems: the nervous system as a controller, sensory systems of the body, neurons and action potentials, muscles as actuators.

Module 2 Mechanics and materials: the body in motion, mechanical properties of tissues, mechanical analysis of body parts and their motion, materials and their properties for biomechatronic engineering.

Module 3 Electrodes: applications of electrodes, recording and stimulation of bioelectronic signals, electrode-tissue interface.

Module 4 Sensors, power sources and control: covering a range of sensors, power sources and control strategies used in bio-mechatronics. Prosthetic electronic skins.

Module 5 Bioprinting: 3D printing technologies in biomedicine, Signals: signal acquisition, processing and analysis. Filters, ADC and amplification of bioelectronic signals.

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EDUCATION EMPOWERS

Certification Course

on

Cyber Security (CCCS 04)

Offered by

School of Computer Science and Engineering

Shobhit Institute of Engineering and Technology
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Why take up this course?

- To gain the ability to define the design, architecture, and management of an organization's security
- To perform data loss prevention and risk analysis
- To acquire an understanding of the security architecture, models, engineering, and cryptography
- To get familiar with network security and communications, identity and access management, operations, and security testing

Career Prospects of this course

- IT Directors
- IT Security Consultants
- Security Auditors
- IT Managers
- Security Analysts
- Directors of Security
- Security Managers
- Network Architects
- Security Systems Engineers
- Security Architects
- Chief Information Security Officers

Program Curriculum

Cyber Security Training Course Content

1. **SECURITY AND RISK MANAGEMENT**
    - Regulatory and legal issues
    - Confidentiality, availability, and integrity concepts
    - Principles of security governance
    - Compliance and professional ethics
    - Requirements of business continuity
    - Policies of personnel security
    - Threat modeling and risk considerations
    - Security education, awareness, and training
    - Security policies, standards, procedures, and guidelines
2. **ASSET SECURITY**
    - Privacy protection
    - Asset and information classification
    - Ownership
    - Data security controls and appropriate retention
    - Requirements handling
3. **SECURITY ARCHITECTURE AND ENGINEERING**
    - Security evaluation models
    - Fundamental concepts of security models
    - Security designs, architectures, and solution elements vulnerabilities

- Information systems security capabilities
- Using secure design principles for engineering processes
- Vulnerabilities of web-based and mobile systems
- Cryptography
- Vulnerabilities of cyber-physical systems and embedded devices
- Secure principles of facility and site design
- Physical security

4. COMMUNICATION AND NETWORK SECURITY

- Architectural design of a secure network
- Channels for secure communication
- Components of a secure network
- Network attacks

5. IDENTITY AND ACCESS MANAGEMENT (IAM)

- Logical/physical access to assets management
- Authentication and identification management
- Integrating identity as a third-party service
- Mechanism of authorization
- Provisioning life cycle's identity and access

6. SECURITY ASSESSMENT AND TESTING

- Test outputs (e.g., manual and automated)
- Security process data (e.g., operational and management controls)
- Vulnerabilities of security architectures
- Testing of security control
- Test and assessment strategies

7. SECURITY OPERATIONS

- Monitoring and logging activities
- Investigation requirements and support
- Incident management
- Resource provision
- Concepts of foundational security operations
- Recovery strategies
- Techniques of resource protection
- Physical security
- Measures of prevention
- Vulnerability and patch management
- Processes of change management
- Exercises and planning of business continuity
- Personnel safety concerns
- Plans and processes for disaster recovery

8. SOFTWARE DEVELOPMENT SECURITY

- Security controls for development environment
- Software development life cycle security
- Impact of acquired software security
- Effectiveness of software security

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EDUCATION EMPOWERS

Certification Course

on

Digital Marketing (CCBS 02)

Offered by

School of Business Studies

Shobhit Institute of Engineering and Technology

(Deemed to be University)

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Digital Marketing

Overview:
In simple terms, digital marketing is the promotion of products or brands via one or more forms of electronic media. Digital marketing is often referred to as online marketing, internet marketing or web marketing.

Duration: 40 Hrs.

Course Objectives:

Digital marketing objectives should be SMART (Specific, Measurable, Achievable, Relevant and Time Related); and you should benchmark against your competitors to ensure that you are more effective.

Pre-requisite / Target Audience:

- No prior knowledge about marketing or digital marketing is required
- Speak and write English fluently
- Have broadband internet access
- Have basic PC skills and online access
- Be over the age of 18
- Be fully committed to Squared!

Module 1: Introduction to Digital Marketing:

In this module you will learn what is digital marketing, and importance of digital marketing. And you will also learn what is web site and levels of web site, Difference between blog, portal & website.

- What is digital marketing?
- How is it different from traditional marketing?
- ROI between Digital and traditional marketing?
- Discussion on Ecommerce
- Discussion on new trends and current scenario of the world?
- Digital marketing a boon or a Bane?
- How can digital marketing be a tool of success for companies?
- Video on importance of digital marketing
- Analysis of recent info graphics released by companies about digital marketing?
- How did digital marketing help the small companies and top inc
- Categorization of digital marketing for the business
- Diagnosis of the present website and business.

- Swot analysis of business, present website and media or promotion plan.
- Setting up vision,mission,and goals of digital marketing

Understanding a website

- What is a website?
- Levels of websites?
- Diff b/w Blog, Portal and Website?
- Diff b/w websites either static or dynamic

Module 2: Search Engine Optimization (SEO):

In this module you will learn complete about SEO (Search engine Optimization, what is On page optimization, Off page optimization, and you also learn how to prepare a reports like- Keywords, titles, meta tags etc..

- On page optimization techniques
- Off page Optimization techniques
- Reports

Module 3: Social Media Optimization (SMO):

In this module you will learn how to do SMO (Social Media Optimization) like Facebook, Twitter, LinkedIn, Tumblur, Pinterest and more social media services optimization.

- Introduction to social Media Marketing
- Advanced Facebook Marketing
- Word Press blog creation
- Twitter marketing
- LinkedIn Marketing
- Google plus marketing
- Social Media Analytical Tools

Module 4: Search Engine Marketing:

In this module you will learn what SME (Search Engine Marketing) is a paid tool like Google Adwords, now a days we have so many paid tools we discuss is briefly and display advertising techniques and all.

- Introduction to Search Engine Marketing
- Tools used for Search engine Marketing
- PPC /Google Adwords Tool
- Display advertising techniques
- Report generation

Module 5: Additional Module:

In this module you will learn about tools for more useful to SEO, these tool used for analysis on website traffic, keyword analysis and also you can learn Email marketing and all.

- Google Analytics
- Online Reputation Management
- E-Mail Marketing
- Affiliate Marketing
- Social Media Analytics
- Ad designing

At the end of the course participants will be able to

1. Online & Offline SEO
2. Competitive Analysis For Smarter Marketing
3. You will learn how to use dozens of proven digital marketing strategies
4. You will learn how to use all of the most popular social media platforms to grow your business
5. You will see tangible results by taking action throughout the entire course
6. You will increase conversions and sales with real world techniques
7. You will improve your brand identity and grow your brand's audience

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EDUCATION EMPOWERS

Certification Course

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Ethical Hacking (CCCS 03)

Offered by

School of Computer Science and Engineering

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Who is a Certi ied Ethical Hacker?

A Certified Ethical Hacker is a specialist typically working in a red team environment, focused on attacking computer systems and gaining access to networks, applications, databases, and other critical data on secured systems. A CEH understands attack strategies, the use of creative attack vectors, and mimics the skills and creativity of malicious hackers. Unlike malicious hackers and actors, Certified Ethical Hackers operate with permission from the system owners and take all precautions to ensure the outcomes remain confidential. Bug bounty researchers are expert ethical hackers who use their attack skills to uncover vulnerabilities in the systems.

Course Description

The Certified Ethical Hacker (CEH) credential is the most trusted ethical hacking certification and accomplishment recommended by employers globally. It is the most desired information security certification and represents one of the fastest-growing cyber credentials required by critical infrastructure and essential service providers. Since the introduction of CEH in 2003, it is recognized as a standard within the information security community. CEH v11 continues to introduce the latest hacking techniques and the most advanced hacking tools and exploits used by hackers and information security professionals today. The Five Phases of Ethical Hacking and the original core mission of CEH remain valid and relevant today: "To beat a hacker, you need to think like a hacker."

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Certi ied Ethical Hacker (CEH) Version 11

CEH provides an in-depth understanding of ethical hacking phases, various attack vectors, and preventative countermeasures. It will teach you how hackers think and act maliciously so that you will be better positioned to set up your security infrastructure and defend future attacks. Understanding system weaknesses and vulnerabilities help organizations strengthen their system security controls to minimize the risk of an incident.

CEH was built to incorporate a hands-on environment and systematic process across every ethical hacking domain and methodology, giving you the opportunity to work towards proving the required knowledge and skills needed to perform the job of an ethical hacker. You will be exposed to an entirely different posture towards the responsibilities and measures required to be secure.

In its 11th version, CEH continues to evolve with the latest operating systems, tools, tactics, exploits, and technologies. Here are some critical updates of CEH v11:

Incorporating Parrot Security OS

When compared to Kali Linux, Parrot Security OS offers better performance on lower-powered laptops and machines while offering an intuitive look and feel with a larger repository of general tools.

Re-Mapped to NIST/NICE Framework

CEH v11 is mapped rigorously to important Specialty Areas under the NIST/NICE framework's Protect and Defend (PR) job role category overlapping with other job roles, including Analyze (AN) and Securely Provision (SP).

Enhanced Cloud Security, IoT, and OT Modules

CEH v11 covers updated Cloud and IoT modules to incorporate CSP's Container Technologies (e.g., Docker, Kubernetes), Cloud Computing threats, and a number of IoT hacking tools (e.g. Shikra, Bus Pirate, Facedancer21, and more). This is critical as the world moves towards broader and deeper cloud adoptions.

Cloud-Based Threats

As the cloud industry is estimated to reach $354 billion by 2022, the businesses struggle to limit the frequency of data theft incidents due to misconfigured cloud environments. January to April 2020 alone saw a 630% spike in cloud-based attacks. Learn how to avoid, identify, and respond to cloud-based attacks with CEH v11.

IoT Threats

Market reports anticipate that the worldwide IoT-connected devices are expected to reach 43 billion by 2023. To support this rapid expansion, the prominent players of the internet, including Amazon Web Services, Google, IBM, Microsoft, are swiftly shifting to private cloud services, creating complexities in IoT ecosystems. Learn to deal with IoT-based attacks with the CEH v11 course that covers the latest IoT hacking tools, such as Shikra, Bus Pirate, Facedancer21, and many others.

Operational Technology (OT) Attacks

Last year, businesses experienced a 2,000% increase in OT based incidents. You can gain expertise in OT, IT, and IIoT (industrial IoT) to secure a critical enterprise OT/IoT deployments. To learn the advanced skills of OT, CEH covers concepts of OT, such as ICS, SCADA, and PLC, various challenges of OT, OT hacking methodology, tools, communication protocols of an OT network like Modbus, Profinet, HART-IP, SOAP, CANopen, DeviceNet, Zigbee, Profibus, etc., and gaining Remote Access using DNP3 protocol.

Modern Malware Analysis

CEH v11 now includes the latest malware analysis tactics for ransomware, banking and financial malware, IoT botnets, OT malware analysis, Android malware, and more!

Covering the Latest Threats - Fileless Malware

As the security community observed a rise in fileless attacks, it began to raise concerns about fileless malware attacks. As fileless malware is a relatively new form of malware attack, organizations find it difficult to detect with endpoint security solutions. With the CEH v11, you can now learn various fileless malware techniques with associated defensive strategies, as the course focuses on the taxonomy of fileless malware threats, fileless malware obfuscation techniques to bypass antivirus, launching fileless malware through script-based injection, launching fileless malware through phishing, and more.

New Lab Designs and Operating Systems

This latest iteration of CEH v11 includes new operating systems, including Windows Server 2019, Windows Server 2016, and Windows 10 configured with Domain Controller, firewalls, and vulnerable web applications for practicing and improving hacking skills.

Increased Lab Time and Hands-on Focus

More than 50% of the CEH v11 course is dedicated to practical skills in live ranges via EC-Council labs. EC-Council leads in this aspect of the industry.

Industry's Most Comprehensive Tools Library

The CEH v11 course includes a library of the latest tools required by security practitioners and pen testers across the world.

Course Outline

Module 01	Introduction to Ethical Hacking
Module 02	Footprinting and Reconnaissance
Module 03	Scanning Networks
Module 04	Enumeration
Module 05	Vulnerability Analysis
Module 06	System Hacking
Module 07	Malware Threats
Module 08	Sniffing
Module 09	Social Engineering
Module 10	Denial-of-Service
Module 11	Session Hijacking
Module 12	Evading IDS, Firewalls, and Honeypots
Module 13	Hacking Web Servers
Module 14	Hacking Web Applications
Module 15	SQL Injection
Module 16	Hacking Wireless Networks
Module 17	Hacking Mobile Platforms
Module 18	IoT and OT Hacking
Module 19	Cloud Computing
Module 20	Cryptography

What You Will Learn ?

- Key issues include plaguing the information security world, ethical hacking, information security controls, laws, and standards.
- Perform footprinting and reconnaissance using the latest footprinting techniques and tools as a critical pre-attack phase required in ethical hacking.
- Network scanning techniques and scanning countermeasures.
- Enumeration techniques and enumeration countermeasures.
- Vulnerability analysis to identify security loopholes in the target organization's network, communication infrastructure, and end systems.
- System hacking methodology, steganography, steganalysis attacks, and covering tracks to discover system and network vulnerabilities.
- Different types of malware (Trojan, Virus, worms, etc.), system auditing for malware attacks, malware analysis, and countermeasures.
- Packet sniffing techniques to discover network vulnerabilities and countermeasures to defend sniffing.
- Social engineering techniques and how to identify theft attacks to audit human-level vulnerabilities and suggest social engineering countermeasures.
- DoS/DDoS attack techniques and tools to audit a target and DoS/DDoS countermeasures.
- Session hijacking techniques to discover network-level session management, authentication/authorization, cryptographic weaknesses, and countermeasures.
- Web server attacks and a comprehensive attack methodology to audit vulnerabilities in web server infrastructure, and countermeasures.
- Web application attacks and comprehensive web application hacking methodology to audit vulnerabilities in web applications, and countermeasures.
- SQL injection attack techniques, injection detection tools to detect SQL injection attempts, and countermeasures.
- Wireless encryption, wireless hacking methodology, wireless hacking tools, and Wi-Fi security tools.
- Mobile platform attack vector, android vulnerability exploitations, and mobile security guidelines and tools.
- Firewall, IDS and honeypot evasion techniques, evasion tools and techniques to audit a network perimeter for weaknesses, and countermeasures.
- Cloud computing concepts (Container technology, serverless computing), various threats/attacks, and security techniques and tools.
- Penetration testing, security audit, vulnerability assessment, and penetration testing roadmap.
- Threats to IoT and OT platforms and learn how to defend IoT and OT devices securely.
- Cryptography ciphers, Public Key Infrastructure (PKI), cryptography attacks, and cryptanalysis tools.

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Target Audience

- Information Security Analyst / Administrator
- Information Assurance (IA) Security Officer
- Information Security Manager / Specialist
- Information Systems Security Engineer / Manager
- Information Security Professionals / Officers
- Information Security / IT Auditors
- Risk / Threat/Vulnerability Analyst
- System Administrators
- Network Administrators and Engineers

Suggested Course Duration

Minimum Hours: 40

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EDUCATION EMPOWERS

Certification Course

on

Internet of Things (CCCS 02)

Offered by

School of Computer Science and Engineering

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Certificate Course in Internet of Things (IOT) Using Arduino

Objective of the Course:

This Course focuses on hands-on IoT concepts such as sensing, actuation and communication. It covers the development of Internet of Things (IoT) prototypes—including devices for sensing, actuation, processing, and communication—to help you develop skills and experiences. The Internet of Things (IOT) is the next wave, world is going to witness. Today we live in an era of connected devices the future is of connected things.

Learning Outcome:

After the completion of the course, the students will be able design some IOT based prototypes

Duration of the Course: 60 Hrs.

Minimum Eligibility Criteria:

Pursuing/Passed BE/B.Tech/BCA/BSc.

COURSE OUTLINE

Sr. No.	Modules to be Covered
1	Introduction to IOT
2	Simulation Environment
3	Sensor & Actuators with Raspberry Pi
4	Basic Networking with Wi-Fi module
5	IoT Protocols
6	Cloud Platforms for IOT

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Contents to be covered

Module 1

Introduction to IoT: Architectural Overview, Design Principles and needed capabilities, IoT Applications, Sensing, Actuation, Basics of Networking, M2M and IoT technology Fundamentals, Devices and Gateways, Data management, Business Processes in IoT, Everything as a Service (XaaS), Role of cloud in IoT, Security aspects in IoT

Module 2

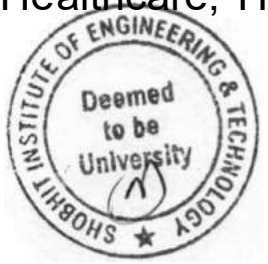
Elements of IoT: Hardware components- Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, i/O Interfaces, Software Components-Programming API's (using Python/Node js/Arduino) for Communication Protocols-MQTT, Zigbee, Bluetooth, CoAP, UDP, TCP.

Module 3

IoT Application Development: Solution framework for IoT Applications, Implementation of device integration, Data acquisition and integration, Device data storage-Unstructured data storage on cloud/local server, Authentication, Authorization of devices.

Module 4

IoT case Studies: IoT Case studies and mini projects based on Industrial automation, Transportation, Agriculture, Healthcare, Home automation



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Certification Course

on

Intellectual Property Rights

(CCLW 01)

Offered by

School of Law and Constitutional Studies

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Background

Indian Law Institute (ILI) has been the pioneer in the field of teaching and training of intellectual property laws and cyber laws. After having established a sound framework for the classroom teaching in these fields, we now plan to traverse the virtual world to embark on e-education.

By e-education is meant an innovative, on-line teaching technique for distance learning that utilizes the Internet for teaching purposes. E-education would bring teachers specializing in intellectual property issues closer to students in all corners of India through virtual means. This method allows students to undertake the ILI educational programs in intellectual property at their own place anywhere in India.

The Institute would use distance learning as an alternative and a complement to traditional training methods in order to make course materials accessible to large audiences throughout India.

About the course

Development of IPR is a recent phenomenon. It is still in a nascent stage and continuously evolving every passing day. Even the most learned legal luminaries find it difficult to solve the legal problems posed by technology. The Online Certificate Course offered by the institute, intends to spread awareness among the general public about the IPR, it is specifically beneficial to the lawyer community and the judges in the subordinate judiciary, who face cases on the daily basis.

The course is designed to give distant education wherein the students need not come to the institute for either classes or examination. The course will be conducted online and the subscribers need to operate from their respective places. All the queries of the subscribers relating to the admission or the conduct will be answered online.

Teaching procedure

The Institute's initiative takes full advantage of information technology and the Internet as an alternative and a complement to traditional training programs. It offers new teaching methodologies, specially-designed course materials, evaluation tools, tailored means of delivery, and greater accessibility.

Teaching would take place in the virtual environment of the Institute's Web site. A network of tutors on the panel of ILI will be available to guide the students. Students and teachers can interact as often as necessary during the course, because communication takes place through e-mail.

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At the end of the program, successful students receive a certificate acknowledging completion of the course.

Things that would take place on-line in the course:

- Registration
- Student-teacher interaction
- Student tests and assignments
- Course monitoring
- Evaluation

Who can pursue?

It is a general course which would be of immense value to persons who fall in the following categories:

- Students
- Lawyers
- Law enforcement personnel - customs officials, police officials, etc.
- Patent agents
- Intellectual Property Offices in Government Sector
- Engineers
- Scientists
- Software Professionals
- Company Executives
- Economists
- Journalists
- Government Officials

Syllabus

The syllabus is divided in four components:

- Patents
- Copyright and neighbouring rights
- Trademarks, Geographical Indications and Domain Names
- Management of Intellectual Property Rights

Duration

40 Hrs.

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Detailed Syllabus

Objectives:

- To introduce fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.
- To disseminate knowledge on patents, patent regime in India and abroad and registration aspects
- To disseminate knowledge on copyrights and its related rights and registration aspects
- To disseminate knowledge on trademarks and registration aspects
- To disseminate knowledge on Design, Geographical Indication (GI), Plant Variety and Layout Design Protection and their registration aspects
- To aware about current trends in IPR and Govt. steps in fostering IPR

Unit 1	Intellectual Property Rights: An overview	
Introduction and the need for intellectual property right (IPR) - Kinds of Intellectual Property Rights: Patent, Copyright, Trade Mark, Design, Geographical Indication, Plant Varieties and Layout Design – Genetic Resources and Traditional Knowledge – Trade Secret - IPR in India : Genesis and development – IPR in abroad - Major International Instruments concerning Intellectual Property Rights: Paris Convention, 1883, the Berne Convention, 1886, the Universal Copyright Convention, 1952, the WIPO Convention, 1967,the Patent Co-operation Treaty, 1970, the TRIPS Agreement, 1994		
Unit 2	**Patents**	
Patents - Elements of Patentability: Novelty, Non-Obviousness (Inventive Steps), Industrial Application - Non - Patentable Subject Matter - Registration Procedure, Rights and Duties of Patentee, Assignment and licence, Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties, Patent office and Appellate Board		

Unit 3	Copyrights	
Nature of Copyright - Subject matter of copyright: original literary, dramatic, musical, artistic works; cinematograph films and sound recordings - Registration Procedure, Term of protection, Ownership of copyright, Assignment and licence of copyright - Infringement, Remedies & Penalties – Related Rights - Distinction between related rights and copyrights		
Unit 4	**Trademarks**	
Concept of Trademarks - Different kinds of marks (brand names, logos, signatures, symbols, well known marks, certification marks and service marks) - Non-Registrable Trademarks - Registration of Trademarks - Rights of holder and assignment and licensing of marks - Infringement, Remedies & Penalties - Trademarks registry and appellate board		
Unit 5	**Other types of IP**	
Design Design: meaning and concept of novel and original - Procedure for registration, effect of registration and term of protection **Geographical Indication (GI)** Geographical indication: meaning, and difference between GI and trademarks - Procedure for registration, effect of registration and term of protection **Plant Variety Protection** Plant variety protection: meaning and benefit sharing and farmers' rights – Procedure for registration, effect of registration and term of protection **Layout Design Protection** Layout Design protection: meaning – Procedure for registration, effect of registration and term of protection		
Unit 6	**Current Regime & Scenario**	
India`s New National IP Policy, 2016 – Govt. of India step towards promoting IPR – Govt. Schemes in IPR – Career Opportunities in IP - IPR in current scenario with case studies		

Course Outcomes:

- The students once they complete their academic projects, shall get an adequate knowledge on patent and copyright for their innovative research works
- During their research career, information in patent documents provide useful insight on novelty of their idea from state-of-the art search. This provides further way for developing their idea or innovations
- Pave the way for the students to catch up Intellectual Property (IP) as a career option
    a. R&D IP Counsel
    b. Government Jobs – Patent Examiner
    c. Private Jobs
    d. Patent agent and Trademark agent
    e. Entrepreneur

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Certification Course

on

Linux Fundamentals

(CCCS 01)

Offered by

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Linux Course Curriculum

Introduction to Linux

Learning Objective: In this module, you will be introduced to various features of Linux. You will learn history, open source licences, various Linux distributions and Linux installation

Topics:

- Need for Linux OS
- What is Linux
- History of Linux
- Relationship Between Unix And Linux
- Features of Linux
- False myths around Linux
- Where Linux is used?
- Components of a Linux OS
- The architecture of Linux OS
- Types of Kernel
- Shell
- Programming in Linux
- Linux Distribution
- Miscellaneous Linux Concepts
- Software Licencing
- Installation and initialisation of Linux
- Shell Scripting
- Practical Uses of Shell Scripting

Initialization of Linux

Learning Objective: In this module, you will understand the user interface, commands and tools, and file operations in Linux

Topics:

- Understand User Interface in Linux
- Implement basic Linux Commands and Tools
- vim Editor
- Advanced Linux Commands
- File System
- File System Comparisons
- File Attributes
- File Operations
- File System Characteristics
- File Access Methods
- Formatting and Partitioning
- Multiboot System
- Learn Packaging Management in Linux

Hands On/Demo:

- Linux Commands
- Vim Editor
- Creating partitions

User Administration

Learning Objective: In this module, you will learn about managing Users and perform Authentication

Configuration

Topics:

- Users in Linux
- User Configuration
- Adding/Deleting/Modifying Users
- Group Administration
- Password Aging Policies
- Switching Accounts
- Sudo
- Network Users
- Authentication Configuration
- SUID and SGID Executable
- SGID Directories
- The Sticky Bit
- Default File Permissions
- Access Control Lists (ACLs)
- Hidden Files

Hands On/Demo:

- Demo – sudo, chown and chmod
- Adding a user
- Delete user
- Modify user
- Hidden Files

Boot and Package Management

Learning Objective: In this module, you will learn about the boot management system and configuring services to run at boot. You will understand package management, which includes installing and removing software and updating a Kernel RPM.

Topics:

- Kernel Configuration
- Boot Management
- Grub Bootloader Configurations
- Red Hat Package Manager
- YUM
- DPKG
- APT
- Build from the source code
- Libraries

Hands On/Demo:

- Sysctl
- Bootloader Configurations
- Red Hat Package Manager
- YUM
- DPKG
- APT

Networking

Learning Objective: In this module, you will learn about OSI layers and various protocols of networking in Linux

Topics:

- OSI layers and Protocols: IPv4, IPv6, TCP, UDP, FTP, TFTP, Telnet, SSH, HTTP, DNS, DHCP, ARP, ICMP etc.
- Packet capturing tools
- Linux commands/tools to troubleshoot networking: netstat, tcpdump, ip, etc.
- Linux utilities: e.g. dnsmasqd, samba server ftpd, webserver, netcat, scp etc.
- Linux Firewall: command, utility and usage.
- Security: SSH, SCP. Certificates, authentication, encryption etc.
- Remote log in: SSH, screen, VNC, etc.

Hands On/Demo:

- IP addresses
- DNS
- ICMP
- dnsmasq.conf
- IP tables

Linux Overview and Scripting

Learning Objective: In this module, you will learn process management, system calls and bash operations

Topics:

- Process Management
- Process Commands
- System Calls
- Output Redirection
- Special Variables in Bash
- Expect Script

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- Python Scripting
- Dictionaries

Hands On/Demo:

- Ps command
- Top command
- Kill command
- Expect

Linux for software development

Learning Objective: In this module, you will learn about programming languages, libraries and profiling tools

Topics:

- Programming languages overview
- Static and Shared libraries
- Compilers, debugger, IDE, ctags, make utility etc.
- Editors in Linux: vi, emacs,
- Troubleshooting and optimization using profiling tools
- Diff, patch and Configuration management system
- Test automation and CI/CD pipeline

Hands On/Demo:

- Libraries
- Makefile

Security Administration, Shell Script and Virtualization

Learning Objective: In this module, we will learn about Linux security administration and Virtualization

Topics:

- Security in IT Industry
- SELinux
- Information gathering tools
- Grub security
- TCP Wrappers
- Securing Shell
- ClamAV
- Virtualization

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EDUCATION EMPOWERS

Certification Course

on

MATLAB from beginner to advance level (CCEC 02)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

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Basic Course Description

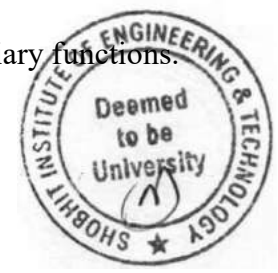
MATLAB (matrix laboratory) is one of the fundamental and leading programming languages and is a must learn skill for anyone who want to develop a career in engineering, science or related fields. Excellent **MATLAB programming skills** is therefore a crucial factor in making or breaking your career.

Duration: 40 Hrs.

This MATLAB course is one of the **most comprehensive MATLAB** courses which will take from **beginner to professional**. This course is designed from a perspective of a student who has **no prior knowledge of MATLAB and who is a MATLAB beginner.**

Throughout this comprehensive course, we cover a massive number of skills and techniques including:

- Basic mathematics and matrix manipulation functions
- Data import and visualization
- MATLAB Programming, problem solving, logic development and the use of customized functions
- Symbolic functions and variables for advance math operations
- File and directory handling
- Live scripts and sharing of results
- Advance data types including cells, tables, time tables and map containers
- Data science classification, clustering and dimensionality reduction with MATLAB
- Essential data preprocessing tasks such as outliers, missing values, categorical attributes handling
- Building regular expressions for textual processing
- Building GUIs using Guide and AppDesigner.
- Automating tasks by controlling mouse, keyboard, running scripts from command window, batch files
- Web, email and other internet related operations
- Generating ppts, word files and pdfs
- Code debugger and analyzer, exception handling, startup, finish and diary functions.



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What you'll learn

- Develop beginner to advance level skills of Programming with MATLAB. This is the only course which enables you to learn intermediate and advance programming data structures such as structures, tables, times tables, cells and map container.
- Gain Hands-On experience with MATLAB for visualizing, analyzing and formulating intermediate and some advanced level problems using MATLAB programming skills
- Experience some real-world applications of MATLAB in solving Data Science problems.

Requirements

- We cover everything from scratch and therefore do not require any prior knowledge of MATLAB
- The installation of MATLAB software on your machine is a must for this course so that you are able to run the commands and scripts that we cover during the course. If you do not have the MATLAB software installed than you may consider the following options
- 1. You may download a free trail copy of the software from the MATHWORK website. This is for limited time use
- 2. If you are student or employee, you may contact your School or employer for a free copy. Many universities offer a free student version of the software
- 3. You may consider downloading the Octave which is a free and has nearly identical functionality as that of MATLAB. (I would not recommend this option since you may not be able to have access to all the functions that we cover in this course)
- 4. If none of the above works for you, then you may purchase the student version directly from MathWorks website which is significantly lower in cost compare to its full version.

Basic Course Description

MATLAB (matrix laboratory) is one of the fundamental and leading programming language and is a must learn skill for anyone who want to develop a career in engineering, science or related fields. Excellent **MATLAB programming skills** is therefore a crucial factor in making or breaking your career.

This course is designed from a perspective of a student who has **no prior knowledge of MATLAB.** The course starts from the very basic concepts and then built on top of those basic concepts and move towards more advanced topics such as **visualization**, exporting and importing of data, **advance data types** and **data structures** and advance programming constructs.

To get the real feel of MATLAB in solving and analyzing real life problems, the course includes **machine learning topics in data science and data preprocessing.**

The course is fun and exciting, but at the same time we dive deep into MATLAB to uncover its power of formulating and analyzing real life problems. The course is structured into four different Parts. Below is the detailed outline of this course.

Part 1: MATLAB from Beginner to Advance

Segment 1.1: Handling variables and Creating Scripts

Segment 1.2: Doing Basic Mathematics in MATLAB

Segment 1.3: Operations on Matrices

Segment 1.4: Advance Math Functions with Symbolic Data Type

Segment 1.5: Interacting with MATLAB and Graphics

Segment 1.6: Importing Data into MATLAB

Segment 1.7: File Handling and Text Processing

Segment 1.8: MATLAB Programming

Segment 1.9: Sharing Your MATLAB Results

Part 2: Advance MATLAB Data Types

Segment 2.1: Cell Data Type

Segment 2.2: Tables and Time Tables

Segment 2.3: Working with Structures and Map Container Data Type

Segment 2.4: Converting between Different Data Types

Part 3: Machine Learning for Data Science Using MATLAB

Segment 3.1 Data Preprocessing

Segment 3.2. Classification

Segment 3.2.1 K-Nearest Neighbor

Segment 3.2.2 Naive Bayes

Segment 3.2.3 Decision Trees

Segment 3.2.4 Support Vector Machine

Segment 3.2.5 Discriminant Analysis

Segment 3.2.6 Ensembles

Segment 3.2.7 Performance Evaluation

Segment 3.3 Clustering

Segment 3.3.1 K-Means

Segment 3.3.2 Hierarchical Clustering

Segment 3.4 Dimensionality Reduction

Segment 3.5 Project

Part 4: Data Preprocessing for Machine Learning using MATLAB

Segment 4.1 Handing Missing Values

Segment 4.2 Dealing with Categorical Variables

Segment 4.3 Outlier Detection

Segment 4.4 Feature Scaling and Data Discretization

Segment 4.5 Selecting the Right Method for your Data

Who this course is for:

- Anyone looking to build a strong career in science or engineering through Excellent MATLAB coding skills
- Anyone wanting to advance their skills of real-world problem solving with MATLAB based scientific computing

By taking this course, you will become a **fluent** MATLAB programmer and you'll be so good so that you can get a reasonable job offer as a MATLAB developer and use the language professionally.

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Certification Course

on

Personality Development and Soft Skills (CCBS 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
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Personality Development and Soft Skills

INTENDED AUDIENCE : Students, Teachers, Professionals, Trainers, Leaders, Employers

DURATION: 40 Hrs.

INDUSTRIES APPLICABLE TO: All industries/companies/organizations will recognize and value this course and recommend this for their employees and trainee programs.

COURSE OUTLINE :

The course aims to cause a basic awareness about the significance of soft skills in professional and inter-personal communications and facilitate an all-round development of personality. Hard or technical skills help securing a basic position in one's life and career. But only soft skills can ensure a person retain it, climb further, reach a pinnacle, achieve excellence, and derive fulfilment and supreme joy. Soft skills comprise pleasant and appealing personality traits as self-confidence, positive attitude, emotional intelligence, social grace, flexibility, friendliness and effective communication skills.

COURSE PLAN :

Week 01 : Introduction: A New Approach To Learning, Planning And Goal-Setting, Human Perceptions: Understanding People, Types of Soft Skills: Self-Management Skills, Aiming For Excellence: Developing Potential And Self-Actualisation, Need Achievement And Spiritual Intelligence.

Week 02 : Conflict Resolution Skills: Seeking Win-Win Solution, Inter-Personal Conflicts: Two Examples, Two Solutions, Types of Conflicts: Becoming A Conflict Resolution Expert, Types of Stress: Self-Awareness About Stress, Regulating Stress: Making The Best out of Stress.

Week 03 : Habits: Guiding Principles, Identifying Good And Bad Habits, Habit Cycle; Breaking Bad Habits, Using The Zeigarnik Effect For Productivity And Personal Growth, Forming Habits of Success.

Week 04 : Communication: Significance Of Listening, Active Listening, Barriers To Active Listening; Telephone Communication: Basic Telephone Skills, Advanced Telephone Skills, Essential Telephone Skills.

Week 05 : Technology And Communication: Technological Personality?, Mobile Personality?, E-Mail Principles, How Not To Send E-Mails!, Netiquette, E-Mail Etiquette.

Week 06 : Communication Skills: Effective Communication, Arising Out Of Sender/Receiver's Personality; Barriers To Communication: Interpersonal Transactions, Miscommunication; Non-Verbal Communication: Pre-Thinking Assessment-1 & 2.

Week 07 : Nonverbal Communication: Introduction And Importance, Issues And Types, Basics And Universals, Interpreting Non-Verbal Cues; Body Language: For Interviews, For Group Discussions.

Week 08 : Presentation Skills: Overcoming Fear, Becoming A Professional, The Role Of Body Language, Using Visuals, Reading Skills: Effective Reading, Human Relations: Developing Trust And Integrity.

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Certification Course

on

Retail Management (CCBS 03)

Offered by

School of Business Studies

Shobhit Institute of Engineering and Technology
(Deemed to be University)

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Retail Management

Certification Code

This integrated certificate course in retail management, concentrates on the Retail sector's emerging and the most prevalent trends. The Retail world's most crucial aspects like Category Management, Retail Buying, Store Operations, Customer Marketing and Retail Strategies have been rightly explored. This may help individuals embark on a career in one of the many roles in the Retail industry.

Why should one take this certification?

This Course is intended for professionals and graduates wanting to excel in their chosen areas. It is also well suited for those who are already working and would like to take certification for further career progression.

Earning Vskills Retail Management Professional Certification can help candidate differentiate in today's competitive job market, broaden their employment opportunities by displaying their advanced skills, and result in higher earning potential.

Who will benefit from taking this certification?

Job seekers looking to find employment in retail departments of various companies, students generally wanting to improve their skill set and make their CV stronger and existing employees looking for a better role can prove their employers the value of their skills through this certification.

Course Duration

30 Hrs.

SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

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Shobhit Institute of Engg. & Tech.
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NH-58, Modipuram, Meerut-250110

Table of Contents

7. The Demand-Driven Supply Chain

7.1 Vision for The Demand-Driven Supply Chain
7.2 The Path From Forecast-Driven To Demand-Driven Supply Chain
7.3 Demand-Driven Tools And Techniques
7.4 Sponsoring The Demand-Driven Supply Chain

8. Product Tracking Along Retail Supply Chains

8.1 Introduction
8.2 Low Tech Retailing
8.3 Beyond Basic Bar Codes
8.4 Radio Frequency Identification
8.5 Tracking In Transit
8.6 The Future Of Product Tracking

9. Understanding Supply Chain Costs

9.1 Introduction
9.2 Barriers To Cost Visibility
9.3 Goal: Activity-Based Costing By Product
9.4 The Starting Point (i-a)
9.5 Department Costs With Capital Recovery (ii-b)
9.6 Multicompany Process Cost (iii-c)
9.7 Activity-Based Costs By Product (iv-d)
9.8 Understanding costs—summary

10. Retail Return

10.1 Introduction
10.2 Genco Case Study—The Rise Of The Return Loop
10.3 Types of Returns
10.4 Opportunities In Returns

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EDUCATION EMPOWERS

Certification Course

on

Solar Power Technology

(CCEE 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

SOLAR POWER TECHNOLOGY

PRE-REQUISITES : Basic knowledge of heat transfer, thermodynamics and fundamentals of physics

COURSE DURATION: 35 Hrs.

INTENDED AUDIENCE : UG, PG and Doctorate students

INDUSTRIES APPLICABLE TO : This course will be very much effective for the engineers working in the Solar Industries

COURSE OUTLINE :

The course content is designed to provide comprehensive knowledge on solar radiation, analysis of solar radiation data, fundamentals of the solar thermal and photovoltaic system along with storage of energy required for effective design of efficient solar energy conversion devices. The concepts will be illustrated with practical examples, schematics and block diagrams wherever required. A sufficient number of numerical problems with solutions will be discussed in the course. This course is specifically designed for undergraduate and postgraduate students of Energy Engineering and Technology. Further, the course will be very much useful for students and researchers from varied academic backgrounds for the synthesis of novel energy conversion devices and processes.

COURSE PLAN :

Week 1: Energy Scenario, overview of solar energy conversion devices and applications, physics of propagation of solar radiation from the sun to earth.

Week 2: Sun-Earth Geometry, Extra-Terrestrial and Terrestrial Radiation, Solar energy measuring instruments

Week 3: Estimation of solar radiation under different climatic conditions, Estimation of total radiation

Week 4: Fundamentals of solar PV cells, principles and performance analysis, modules, arrays, theoretical maximum power generation from PV cells

Week 5: PV standalone system components, Standalone PV-system design.

Week 6: Components of grid-connected PV system, solar power plant design and performance analysis.

Week 7: Fundamentals of solar collectors, Snails law, Bougers law, Physical significance of Transmissivity - absorptivity product.

Week 8: Performance analysis of Liquid flat plate collectors and testing

Week 9: Performance analysis of Solar Air heaters and testing

Week 10: Solar thermal power generation (Solar concentrators).

Week 11: Thermal Energy Storage (sensible, latent and thermo-chemical) and solar pond

Week 12: Applications: Solar Refrigeration, Passive architecture, solar distillation, and emerging technologies.

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EDUCATION EMPOWERS

Workshop on on Placement Preparation

Date:
16 Jan.
to
04 Feb. 2020

Venue:
University Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

University Training and Development Cell

Shobhit Institute of Engineering & Technology, Meerut

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EDUCATION EMPOWERS

A Short Term Course
on
Organic Farming

Date:
11 Feb.
to
27 Feb.
2020

Venue:
University
Farms

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Agriculture and Agriinformatics

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EDUCATION EMPOWERS

A Short Term Course
on
Industrial Biotechnology, Food safety and Quality Control

Date:
11 Feb.
to
27 Feb. 2020

Venue:
Biotechnology Lab

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Biotechnolgy

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Shobhit
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EDUCATION EMPOWERS

"An Investment in Knowledge pays the best interest"

School of Engineering and technology invites you for Certification Course on

"CATIA V5 FUNDAMENTALS"

Trainer
Mr. Jitendra K. S. Jadon
Assistant Professor
Mechanical Engineering Department
Shobhit Institute of Engineering and Technology, Meerut.

Date: July 08 to July 19, 2019

Timings: 10:00 am to 1:00 pm daily

Fees: 1000 INR

Register Here

https://forms.gle/7yiFvN1PkrMMATgD7

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Department of Mechanical engineering

Shobhit Institute of Engineering and Technology, Meerut

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NH-58, Modipuram, Meerut – 250110

Website: www.shobhituniversity.ac.in

Micro certification Course on

CATIA V5 Fundamentals Training

The CATIA V5 Fundamentals course is designed to provide delegates with a broad skill set for using CATIA V5. It is a starting point for CATIA and the knowledge gained is a prerequisite for many more specialized training courses.

About this course

Duration:

14 days

Course Objective:

CATIA V5 Fundamentals should not be viewed as just a basic course, as together with the key CATIA skills that are on offer, the student will also pick up very important advice on engineering methodologies. The course includes a mixture of presentation and tutorial, enabling students to gain hands-on experience.

Course Fee:

1000 INR

The course covers the following topics:

- Introduction to CATIA V5
- Sketcher
- Creating Solids
- Advanced Sketcher
- Transformations
- Dress-up Features
- Advanced Solids
- Wireframe Geometry
- Surfaces
- Assemblies
- Drafting

Who Should Attend?

New CATIA V5 Mechanical Designers, Mechanical Engineers, Aerospace Engineers and Automotive Engineers. A working knowledge of other 2D/3D packages would be advantageous.

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EDUCATION EMPOWERS

A Short Term Course
on
Biomedical Waste Management

Date:
16 August
to
29 August
2019

Venue:
Biomedical
Lab.

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Biomedical Engineering

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Shobhit
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Deemed to-be-University

EDUCATION EMPOWERS

School of Engg. and Tech. invites you for workshop On

Remote Sensing

Date
2 Sept.
to
18 Sept. 2019

Time
2:00 pm
to
5:00 pm

Registrar
Shobhit Institute of Engg. & Tech.
(Deemed to-Be University)
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Organized By

Department of Electronics and Communication Engineering

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Website: www.shobhituniversity.ac.in

Shobhit
Institute of Engineering & Technology
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EDUCATION EMPOWERS

School of Engg. and Tech. invites you for workshop On

Industrial Robotics

Date
20 Sept.
to
07 Oct. 2019

Time
2:00 pm
to
5:00 pm

Registrar
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Shobhit
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EDUCATION EMPOWERS

A Specialized Course on Intelligence System

Date:
02 Sept.
to
18 Sept.
2019

Venue:
Computer Lab.

Time:
3:00 pm to
5:00 Pm

Organized by

School of Computer Science & Engineering

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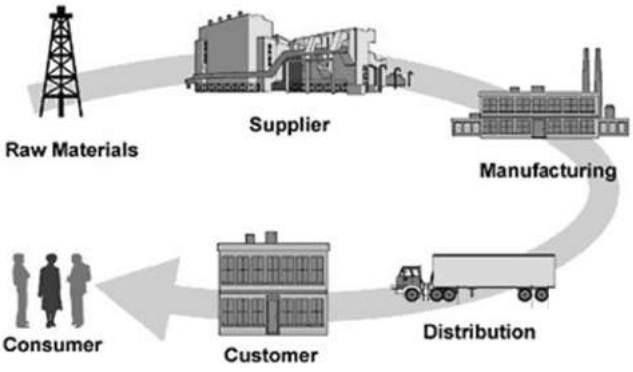
EDUCATION EMPOWERS

A Specialized Course on RFID and its applications

Date:
01 June to 20 July 2020



Venue:
Electronics Lab.

Time:
3:00 pm to 5:00 Pm

Organized by

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Shobhit
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Deemed to-be-University

EDUCATION EMPOWERS

School of Business Studies invites you for workshop On

Personal Enrichment and Life Skills

Date
7 Sept.
to
19 Sept. 2019

Time
11:00 am
to
2:00 pm

Organized By

Registrar
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School of Business Studies

Shobhit Institute of Engineering & Technology, Meerut
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NH-58, Modipuram, Meerut - 250 110
Website: www.shobhituniversity.ac.in

Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

Online Course on on Managing Emotions

Date:
22 June.
to
29 June. 2020

Venue:
University Auditorium

Time:
1:00 pm to
5:00 Pm

Organized by

School of Business Studies

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Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

Online Course on
on
Stress Management

Date:
29 Nov.
to
15 Dec. 2020

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by
School of Business Studies

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EDUCATION EMPOWERS

A Short Term Course
on
Drug Quality Control and assurance

Date:
7 October
to
23 October
2019

Venue:
Biomedical Lab.

Time:
3:00 pm to
5:00 pm

Organized by

Department of Biomedical Engineering

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EDUCATION EMPOWERS

A Short Term Course
on
Fermentation Technology

Date:
3 Feb.
to
19 Feb. 2020

Venue:
Biotechnology Lab

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Biotechnolgy

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EDUCATION EMPOWERS

A Short Term Course
on
Bio Instrumentation

Date:
4 March
to
20 March
2020

Venue:
Biotechnology
Lab.

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Biotechnolgy

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EDUCATION EMPOWERS

Online Course
on
Yoga for wellness: A way of life

Date:
14 Oct.
to
30Oct. 2019

Venue:
Online

Time:
3:00 pm to
5:00 Pm

Registration link: *https://forms.gle/7yiFvN1PsfdsdxPsdgD7*

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EDUCATION EMPOWERS

Certification Course

on

Acoustical Physics of Music

(CCAS 01)

Offered by

School of Basic and Applied Sciences

Shobhit Institute of Engineering and Technology

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
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Acoustical Physics of Music

Prerequisites: None

Course Objective: To provide a fundamental physical understanding of the nature of sound, hearing, and music.

Course Duration: 40 Hrs.

Course Description:
We will begin to explore increasingly intricate aspects of how simple waves are combine in extremely precise ways to create the complex sounds we experience in everyday life, with a focus on how our perception of these sounds works, how the phenomenon of music arises, how certain instruments create their own unique versions of it, and how music is recorded and/or presented to an audience. We understand that most of you are not majors in science or engineering, so some of the technical concepts will be new to you.

Unit 1. Oscillations, Waves and Sound

Simple harmonic oscillations. Amplitude, period, and frequency (pitch). Harmonic oscillations with slowly changing parameters. Perception of sound. Combinations of harmonic oscillations. Beats. Phase relations and psychoacoustical Ohm's law, phase beats. Damped and driven oscillations, resonance. Periodic waves, solitary waves, wave packets. Wave length, sound velocity. Spherical and cylindrical waves. Longitudinal and transverse waves. Surface acoustic waves. Reflection and refraction of waves. Refraction of sound in the atmosphere. Doppler effect. Sonic booms and shock waves.

Unit 2. Standing Waves and Overtone Series

Standing waves in general. Role of boundary conditions in the formation of standing waves. Node-node, antinode-antinode, and node-antinode boundary conditions. Overtone's series. Mersenne's laws. Analysis and Synthesis of Complex Waves: Synthesis of complex waves. Fourier analysis and Fourier spectra. Analysis of tone quality: Attacks and decays, formants. Vibrato and tremolo. Discrete and continuous Fourier spectra. Spectrograms: Narrow-band and wide-band.

Unit 3. Hearing, Speech and singing

Transmission of the signal through the ear parts. Place theory of hearing: Frequency response and frequency resolution. amplitude and the intensity of the sound. neurophysiology of the hearing process. Sensitivity of the ear to the sound intensity. The decibel scale of sound

intensity level. Nonlinearity of the ear. Aural harmonics. Combinational tones. Fundamental tracking. Cochlear implants as a confirmation of the place theory of hearing. Structure of speech and singing apparatus. Throat and mouth as a resonator. Naive open-closed-pipe theory of the throat-mouth resonator. Resonances as formants in shaping the output sound. Production of the glottal wave by the vocal folds, Bernoulli law. Difference between singing, speech, and hoarse speech. Simplified two-formant synthesis of vowels.

Unit 4. Room and auditorium acoustics

Direct and reflected sound. Texture of the echo. Definition of the reverberation time. Fullness and clarity. Warmth and brilliance. Formula for the reverberation time. Absorption and reflection coefficients. Resonances in room of a box. shape. General principles of constructing concert halls. architectural acoustics and the science of reverberation, Sabine equation. Basic parameters, design and modification of spaces using different types of absorbers and treatments. Active methods of noise reduction and room treatment (e.g., phantom acoustic shadows). Diffusion through reflection-phase gratings (quadratic-residue and primitive-root diffusers). Helmholtz resonators. Room dimensions.

Unit 5. Equipment used for recording music

Microphones and preamplifiers, analog (tape and records) and digital formats for recording. **Home playback and reproduction of music** – general categorization of mass-Fi, mid-Fi and HiFi qualities and philosophies. Sources (tape, record, CD, DVD-audio, SACD, etc.), preamplifiers (tubes and solid-state, chips vs discrete), amplifiers, speakers (dynamic, electrostatic, planar magnetic, etc.). Room choice and placement of components. Wiring and interfacing (concept of impedance mismatch and mechanical and dielectric degradation). **Working of some acoustical and electronic musical instruments** – electric guitar and its effects, etc.

Learning outcomes: At the end of this course students will be able to

1. Understand how a harmonic oscillator works and the concepts of resonance and formants.
2. Understand the concepts and interrelationships between wavelength, frequency, and speed of a wave.
3. Understand the origin of harmonics in string and wind instruments.
4. Understand the concepts of loudness, intensity levels and decibels.
5. Understand some basics of the neurophysiology of the hearing process and the causes of hearing loss.
6. Understand tones and the basic of musical scales.

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EDUCATION EMPOWERS

Certification Course

on

Automotive Technology Level 1

(CCME 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

Course Descriptions and Outlines

Automotive Technology

Level 1

Course Description

Duration: 60 Hrs.

Term: 3 Hours per day

Prerequisite: none

Description: This is the study of an automobile. There will be a hands-on experience class involving activities that relate directly to maintenance, repair and service. The program of instruction may include: safety in the shop, care and use of tools, interpretation of parts books, parts handling, engine construction, ignition systems, fuel systems, charging systems, starting systems, electronic systems, chassis wiring and diagrams, brakes, lubrications and minor tune-up. Students may be involved in BMW Skill Next Program.

Course Outline

Orientation	Introduce Develop Master
A. Occupational outlook	I
B. Places that employ auto mechanics	I
C. Student requirements for the auto mechanics program	I/D
D. Steps involved in automotive shop work	I/D
E. Skills USA	I
F. Ways Skills USA state and national dues are used	I
G. Mandan automotive program rules	I/D
H. MSDA	I/D
I. Personal information sheet	I/D/M
J. Follow instructions sheet	I/D/M
K. Job application form	I/D/M

Safety	
I. Safety	
A. Terms related to the unit	I/D/M
B. Colors and application of the safety color code	I/D/M
C. Personal safety rules	I/D/M
D. General shop safety rules	I/D/M
E. Safety rules involving hand tools	I/D/M
F. Safety rules involving the engine	I/D/M
G. Battery safety	I/D/M
H. Safety rules involving flammable liquids	I/D/M
I. Equipment safety rules	I/D/M
J. Components of the fire triangle	I/D/M
K. Classes of fire	I/D/M
L. Types of fire extinguishers	I/D/M
II. Machine Safety Rules	
A. Parts washer	I/D/M
B. Engine hoist	I/D/M
C. Grinder	I/D/M
D. Hydraulic press	I/D/M
E. Drill press	I/D/M
F. Hoist	I/D/M
G. Floor jack	I/D/M
H. Pressure washer	I/D/M
III. Automotive lift	
A. Safety tips	I/D/M
B. Safety pledge form	I/D/M
IV. Safety Review	
A. Individual Student Shop Safety Inspection Form	I/D/M
Hand Tools	
A. Purpose of hand tools & storage	I/D/M
B. Types of screwdrivers	I/D/M
C. Types of pliers	I/D/M
D. Types of wrenches	I/D/M
E. Components of a socket set	I/D/M

F. Types of sockets	I/D/M
G. Special purpose sockets	I/D/M
H. Types of hammers used in the auto shop	I/D/M
I. Types of punches	I/D/M
J. Types of chisels	I/D/M
K. Types of files	I/D/M
L. Types of file teeth	I/D/M
M. Types of parts cleaning tools	I/D/M
N. General shop tools	I/D/M
O. Battery service tools	I/D/M
P. Starter service tools	I/D/M
Q. Charging system service tools	I/D/M
R. Ignition service tools	I/D/M
S. Fuel system service tools	I/D/M
T. Exhaust system service tools	I/D/M
U. Cooling system service tools	I/D/M
V. Lubrication service tools	I/D/M
W. Brake service tools	I/D/M
X. Front-end service tools	I/D/M
Y. Engine repair tools	I/D/M
Z. Drive line service tools	I/D/M
AA. General Torque Specification Chart	I
Rules and Measures	
I. Rules	
A. Terms related to the unit	I
B. Basic units of measurement	I/D
C. Fractional units found on rules	I/D
D. Decimal units found on rules	I/D
E. Metric units found on rules	I/D
F. Rules used in shop work	I
G. Uses of the rule with accessories	I
H. Procedure for using rules	I/D
I. Steps for reading the rules	I/D
II. Outside micrometer	
A. Types of measurements found on the outside micrometer	I/D/M
B. Major parts of the outside micrometer	I
C. Steps in selecting the proper size outside micrometer	I/D/M

D. General rules for use and care of micrometers	I/D
E. Definition of "feel" when using a micrometer	I/D
F. Methods of checking accuracy of outside micrometers	I/D/M
G. Reading the plane micrometer	I/D/M
H. Reading the vernier micrometer	I/D/M
Service Manuals	
A. Car information section	I/D/M
B. General service information section	I/D/M
C. Carline unit index	I/D/M
D. Specification sheets	I/D/M
E. Repair information section	I/D/M
F. Labor and parts guide	I/D/M
G. Repair order	I/D/M
Electrical Unit	
I. Basic electrical theory	
A. Terms related to basic electricity	I
B. Parts of the atom and their values	I
C. Electricity according to the electron theory	I
D. Basic factors of electrical flow in a circuit	I
E. Relationship of voltage, amperage, and ohms to current flow	I/D
F. Ohms Law	I/D/M
G. Calculating problems using Ohms Law	I/D/M
H. Factors effecting resistance in a conductor	I/D
I. Basic electrical symbols	I/D/M
J. Components of a basic electrical circuit	I/D/M
K. Types of electrical circuits	I/D/M
L. Instruments for testing electrical circuits	I/D/M
M. Methods of connecting test instruments	I/D/M
N. Basic electrical circuit failures	I/D
O. Characteristics of magnetism	I/D
P. Characteristics of electromagnetism	I/D
Q. Electromagnetic induction	I/D
R. Factors determining magnitude of induce voltage	I/D

II. Battery service	
A. Terms related to the battery	I
B. Functions of a battery	I/D
C. Purposes of the battery parts	I/D
D. Converting chemical energy into electrical energy	I/D
E. Factors affecting battery voltage and capacity	I/D
F. Battery capacity in amperes	I/D
G. Types of battery rating	I/D
H. Safety rules	I/D/M
I. Features of a service-free battery	I
J. Jump starting a vehicle	I/D
III. Charging system	
A. Purpose of the charging system	I/D
B. Terms related to the charging system	I
C. Charging system components	I
D. Parts of the generator	I
E. Parts of the alternator	I/D/M
F. Differences between an alternator and generator	I/D
G. Advantages of a alternator over a generator	I/D
H. Reason an alternator produces more current at low speed than a generator	I/D
I. Stator construction	I/D
J. Types of stator windings	I/D
K. Current and voltage regulation in an alternator	I/D
L. Types of voltage regulators for alternators	I/D
M. Troubleshooting the charging system	I/D/M
IV. Starting system	
A. Terms related to the starting system	I/D
B. Purpose of the starting system	I/D
C. Operating principle of the starter	I
D. Magnetic principles of the starter	I
E. Path of current flow in a series wound starter	I
F. Components of the starting system	I/D
G. Types of starter switches	I/D
H. Parts of the starter	I/D/M
I. Major parts of the gear reduction starter	I/D/M
J. Types of starter drives	I/D
K. Components of a starter control circuit	I/D
L. Starting system control circuit components and their functions	I/D
M. Troubleshooting the starting system	I/D/M

V. Ignition system	
A. Terms related to the ignition system	I/D
B. Purpose of the ignition system	I/D
C. Components of the ignition system	I/D
D. Function of the ignition system components	I/D
E. Distributor components	I/D/M
F. Components of the ignition system circuits	I/D
G. Operation of the ignition system	I/D
H. Parts of the spark plug	I
I. Spark plug heat ranges	I
J. Spark plug conditions and their causes	I/D/M
K. Types of secondary ignition cables	I/D
L. Transistorized and capacitive discharge ignition system	I
M. Relationship of the electronic ignition system to the conventional ignition system	I/D
N. Advantages of the electronic ignition system	I/D
O. Major components of the electronic ignition system	I/D/M
P. Function of the components of the electronic ignition system	I/D
Q. Operation of the electronic ignitions system	I/D
VI. Chassis wiring	
A. Terms related to chassis wiring	I
B. Electrical symbols	I/D
C. Types of electrical terminals and connectors	I/D
D. Types of bulbs used in automobiles	I
E. Parts of the sealed beam	I
F. Differences between hot and ground circuits	I/D
G. Facts about voltage drop	I/D/M
H. Facts about current draw	I/D/M
I. Single and two-wire circuits	I/D
J. Instruments used in testing automobile electrical circuits	I/D/M
K. Steps in diagnosis of an electrical problem	I/D/M
L. Characteristics of a wiring diagram	I/D/M
M. Parts of a typical circuit identification code	I/D/M
Brake Unit	
I. Wheel bearings	
A. Terms related to unit	I/D
B. Types of front wheel bearings	I/D/M
C. Parts of a tapered roller front wheel bearing assembly	I/D/M

D. Characteristics of quality wheel bearing grease	I
E. Precautions to observe while packing wheel bearings	I/D/M
II. Brake systems	
A. Purpose of the brake system	I/D
B. Terms related to unit	I/D
C. Components of the standard brake system	I/D/M
D. Components of the tandem or dual brake system	I/D/M
E. Parts of a standard master cylinder	I/D/M
F. Parts of a tandem master cylinder	I/D/M
G. Parts of a wheel cylinder	I/D/M
H. Parts of a standard brake assembly	I/D/M
I. Types of self-adjusting brake systems	I/D
J. Brake operation	I/D/M
III. Power disc brakes	
A. Terms related to unit	I/D
B. Major components of the disc brake system	I/D
C. Disc brake components and their functions	I/D
D. Types of disc brake calipers	I
E. Parts of a floating caliper disc brake	I/D/M
F. Characteristics of disc brakes	I
G. Reasons disc brakes may require power booster units	I/D
H. Sources of energy used for power boosters	I
I. Types of vacuum operated power boosters	I/D
J. Major parts of a vacuum operated power booster	I
K. Major parts of a hydro-boost power booster	I
L. Operation of the vacuum suspended power booster	I/D/M
M. Operation of the atmospheric suspended power booster	I/D/M
N. Operation of the hydro-boost power booster	I/D/M
O. Requirements of super heavy-duty brake fluid	I
P. Conditions that are considered normal and are not indications that the master cylinder needs service	I/D/M
Q. Parts of a parking brake system on four wheel disc brakes	I
IV. Anti-lock brake system	
A. Safety precautions	I/D/M
B. Lug nut torque specifications	I/D/M
C. Description	I
D. Operation	I
E. Diagnosis and testing	I/D
F. Note on intermittents	I

G. Depressurizing the system	I/D
H. Component removal and installation	I
J. Wheel sensor air gap	I
K. Bleeding brake system	I/D/M
L. Reading wiring diagrams	I/D
M. Pin-out checks	I

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EDUCATION EMPOWERS

Certification Course

on

Automotive Technology Level 2

(CCME 02)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

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Automotive Technology

Level 2

Course Description

Duration: 60 Hrs.

Term: 3 Hours per day

Prerequisite: Automotive Technology Level 1

Description: This is a continuation of the Automotive Technology Level 1 course with more advanced training and more skill required in the use of tools and equipment. This course is designed to give the students the opportunity to learn practical application along with the related material in the following areas: engine rebuilding, transmissions, clutch, drive train, differentials, major tune-up, and electronic emission control systems. The students may be involved in the BMW Skill Next Program.

Course Outline

Engine Repair	Introduce Develop Master
I. Basic Engine Principles	
A. Terms related to the unit	I
B. Characteristics of energy	I
C. Types of energy	I
D. Forms of available energy	I
E. Types of motion	I
F. Simple machines	I
G. Uses of simple machines	I
H. Calculating work	I/D
I. Calculating horsepower	I/D
J. Formula for torque	I/D
K. Characteristic of heat engines	I
L. Types of heat engines	I
M. Parts of basic internal combustion engine	I/D

N. Process for converting chemical energy into rotary motion	I
O. Operation of four-stroke cycle engine	I/D/M
P. Valve timing and overlap	I/D
Q. Operation of two-stroke cycle engine	I/D
R. Formula for cubic inch displacement	I/D
S. Results of increasing compression ratio	I/D
T. Components of an automobile engine	I/D
U. Gasoline and diesel engines	I
V. Purpose of a heavy flywheel	I
II. Engine Condition Evaluation	
A. Terms related to unit	I
B. Conditions causing low oil pressure	I/D
C. Conditions that cause oil consumption	I/D
D. Items to inspect for engine condition evaluation	I/D/M
E. Items to check prior to testing for internal engine noise	I/D/M
F. Internal engine noise diagnosis	I/D/M
III. Engine Removal	
A. Terms related to unit	I
B. Safety precautions to observe while removing an engine	I/D/M
IV. Engine Disassembly	
A. Terms related to unit	I/D
B. Safety precautions to observe during engine disassembly	I/D/M
C. Factors to consider when preparing to disassemble an engine	I/D
D. Items to inspect during engine assembly	I/D/M
V. Valve Train and Cylinder Head Reconditioning	
A. Terms related to unit	I/D
B. Purpose of the valve train	I
C. Parts of the valve train	I/D
D. Function of valve train parts	I/D
E. Camshaft locations	I
F. Methods of driving the camshaft	I/D
G. Parts of the camshaft	I/D
H. Parts of the cam lobe	I/D/M
I. Types of valve lifters	I/D/M
J. Parts of a hydraulic valve lifter	I/D/M
K. Operation of a hydraulic valve lifter	I/D
L. Parts of the valve	I/D/M
M. Parts of a valve assembly	I/D/M
N. Types of valve springs and dampering devices	I/D/M

O. Types of valve stem seals	I/D/M
P. Types of valve spring keepers	I/D/M
Q. Purpose of valve spring spacer	I/D
R. Types of valve rotators	I/D
S. Purpose of valve rotator	I/D
T. Reasons a valve must seat properly	I/D/M
U. Causes of valve burning	I/D/M
V. Tools of valve reconditioning	I/D/M
VI. Engine Crankshaft, Bearings and Oil Pump	
A. Terms related to unit	I
B. Purpose of the crankshaft	I/D
C. Parts of the crankshaft	I/D
D. Methods used to manufacture crankshafts	I
E. Types of bearing used on the cam and crankshaft	I/D
F. Construction of an insert bearing	I
G. Bearing spread and crush	I/D
H. Bearing requirements	I/D
I. Causes of bearing failure	I/D/M
J. Action of lubricating oil in an insert bearing	I/D
K. Purpose of torsional vibration damper and flywheel	I
L. Types of rear main bearing oil seals	I/D
M. Types of oil pumps	I/D
N. Parts of an oil pump	I/D
O. Conditions that could lower oil pressure	I/D/M
VII. Cylinder and Piston Reconditioning	
A. Terms related to unit	I
B. Cylinder wear patterns	I/D
C. Methods of reconditioning cylinders	I/D/M
D. Types of cylinder sleeves	I
E. Reasons cylinders wear tapered	I/D
F. Parts of the cylinder block	I/D
G. Types of cylinder block core hole plugs	I/D
H. Parts of a piston and connecting rod assembly	I/D
I. Types of compression rings	I/D
J. Methods of installing compression rings	I/D/M
K. Types of oil rings	I/D
L. Methods of installing oil rings	I/D/M
M. Methods of heat and expansion control in the piston	I
N. Piston conditions and related causes	I/D/M

O. Lubrication of cylinder walls and piston pins	I/D
P. Tools and equipment used in reconditioning cylinders and pistons	I/D/M
Q. Types of piston pin locks	I/D
VIII. Engine Reassembly	
A. Terms related to unit	I
B. Tools used in engine reassembly	I/D/M
C. Reasons for torqueing bolts to specifications in an engine	I/D/M
IX. Engine Installation	
A. Terms related to unit	I
B. Safety precautions to observe during engine installation	I/D/M
C. Factors to consider when installing an engine	I/D/M
D. Items to check or adjust before starting a new or rebuilt engine	I/D/M
E. Break-in procedure	I/D/M
X. Cooling System	
A. Purpose of the cooling system	I/D
B. Terms related to unit	I
C. Types of thermostats	I/D
D. Thermostat operation	I/D/M
E. Job performed by the cooling system	I/D
F. Downflow and crossflow radiators	I
G. Methods of cooling the internal combustion engine	I/D
H. Types of radiator hoses	I/D
I. Pressure cap operation at various temperatures	I/D/M
J. Variable-speed fan drive operations	I/D/M
K. Reasons for using permanent antifreeze solution	I/D
L. Operation of the coolant recovery system	I/D
M. Belt tension	I/D/M
N. Belt inspection	I/D/M
XI. Engine Lubrication System	
A. Terms related to unit	I
B. Purpose of the engine lubrication system	I
C. Components of the engine lubrication system	I/D
D. Purposes of the components of the engine lubrication system	I/D
E. Types of oil filters	I/D
F. Engine oil classifications	I
G. Oil viscosity classifications	I
H. Oil service designation letters and their descriptions	I
I. Points to consider when selecting engine oil	I/D
J. Additives found in engine oil	I

XII. Exhaust System	
A. Purpose of the exhaust system	I
B. Terms related to unit	I
C. Types of mufflers	I
D. Operation of the manifold heat control valve	I
E. Construction and operation of catalytic converter	I
F. Tools for exhaust system service	I
G. Types of exhaust systems	I
H. Prevention of carbon monoxide poisoning	I/D
I. Causes of corrosion of exhaust system	I
J. Basic components of the exhaust gas recirculating system	I
K. Purpose of exhaust gas recirculating system	I
XIII. Fuel System	
A. Purpose of the fuel system	I
B. Terms related to unit	I
C. Components of the fuel system and their purposes	I
D. Fuel pump operation	I
E. Types of fuel filters	I
F. Types of air cleaners	I
G. Parts of the carburetor	I
H. Carburetor systems and their uses	I
I. Gasoline additives and their purposes	I
J. Fuel injection	I
K. Variations of fuel injection systems	I
Manual Drive Train	
I. Clutch Assembly	
A. Terms related to the unit	I
B. Components of the clutch assembly	I/D
C. Parts of a clutch disc	I
D. Types of pressure plates	I/D
E. Clutch operation	I/D
F. Methods used to actuate clutch release	I
G. Mechanisms that allow smooth clutch engagement	I
H. Conditions to look for during clutch inspection	I/D/M
I. Symptoms that may occur when a clutch housing bore has excessive run-out	I
J. Clutch malfunctions and probable causes	I/D/M
K. Problems not requiring clutch removal	I/D/M

L. Clutch problems requiring clutch removal	I/D/M
II. Standard Transmission	
A. Purpose of the transmission	I
B. Terms related to the unit	I
C. Parts of the transmission	I/D/M
D. Parts of a synchronizer	I/D/M
E. Types of gear teeth	I/D/M
F. Three-speed synchromesh transmission operation	I/D/M
G. Gear operation of a three-speed transmission	I/D/M
H. Basic types of overdrives	I
I. Major parts of the electrically operated overdrive	I
J. Operation of the electrically operated overdrive	I
K. Procedure for performance testing shift linkage adjustment	I/D/M
L. Procedure for performance testing the manual transmission	I/D/M
III. Drive Lines	
A. Terms related to the unit	I
B. Types of drive lines	I
C. Components of a propeller shaft	I
D. Types of U-joints	I
E. Parts of a cross and roller or cardan U-joint	I/D/M
F. Parts of a ball and trunnion U-joint	I
H. Parts of a constant velocity U-joint	I/D/M
I. Acceleration-deceleration of propeller shaft equipped with a cross and roller U-joint	I
J. Major components of a four wheel drive	I
K. Tools used in drive line repair	I
L. Methods of controlling drive line vibration	I
IV. Rear Axle	
A. Purpose of the rear axle assembly	I
B. Terms related to the unit	I
C. Parts of a gear tooth	I/D/M
D. Parts of a conventional differential	I/D/M
E. Parts of the planetary differential	I/D/M
F. Types of differential carrier housings	I/D
G. Ring gear and drive pinion tooth contact pattern	I/D/M
H. Gear tooth contact patterns	I/D/M
I. Types of rear axle shafts	I/D
J. Types of rear axle bearings	I/D
V. Automatic Transmission Service	
A. Terms related to the unit	I

B. Repairs which can be performed with the transmission in the vehicle	I
C. Items to include in a automatic transmission tune-up	I
D. Tests that are performed while transmission is in the vehicle	I/D
E. Types of automatic transmission fluids and their applications	I/D/M
F. Procedure for properly checking transmission fluid level	I/D/M
G. Fluid conditions and possible transmission problems	I/D
H. Types of transmission filters	I
VI. Manual Transaxle Operation	
A. Terms related to the unit	I
B. Transaxle components and how they function	I/D/M
C. Transaxle operation	I/D
VII. Manual Transaxle Diagnosis	
A. The operation and design	I/D/M
B. Half shaft diagnosis	I/D/M
VIII. Transaxle Removal and Disassembly	
A. Safety in transaxle removal	I/D/M
B. Procedure for removing the transaxle	I/D
C. Transaxle disassembly	I/D/M
IX. Transaxle Cleaning, Inspection and Assembly	
A. Procedure for cleaning and inspecting transaxle components	I/D/M
B. Clutch inspection	I/D/M
C. Procedure for reassembling and adjusting the transaxle	I/D/M
D. Half shaft repair procedures	I/D/M
X. Transaxle Installation and Performance Testing	
A. Transaxle installation	I/D
B. Procedures for performance testing the transaxle	I/D
XI. Four-Wheel-Drive Components and Operation	
A. Terms related to the unit	I
B. Four-wheel-drive components and functions	I
C. Driveline operation	I
XII. Four-Wheel-Drive Diagnosis and Repair	
A. Safety in four-wheel-drive diagnosis and repair	I/D/M
B. Procedures for diagnosing a four-wheel-drive vehicle	I
C. Repair procedures for locking hubs	I
D. Procedure for removing the front differential assembly	I
E. Repair procedures for front spindals	I
XIII. Transfer Case Components and How They Function	
A. Transfer case components and their functions	I
B. Transfer case operation	I

XIV. Transfer Case Diagnosis and Removal	
A. Transfer case diagnosis	I
B. Safety in transfer case removal	I/D/M
C. Procedures for removing the transfer case	I
XV. Transfer Case Disassembly, Cleaning, Adjustment and Reassembly	
A. Procedure for disassembly of the transfer case	I
B. Procedure for cleaning and inspecting the transfer case	I
C. Transfer case end-play and torque measurements	I
D. Procedure for reassembly of the transfer case	I
XVI. Transfer Case Installation and Performance Testing	
A. Transfer case installation	I
B. Procedure for performance testing and transfer case	I

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Shobhit
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EDUCATION EMPOWERS

Certification Course

on

Biomechatronics (CCBM 01)

Offered by

School of Biomedical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

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Bio-Mechatronics

About Bio-Mechatronics:

Bio-Mechatronics is an applied interdisciplinary science that aims to integrate biology and mechatronics (electrical, electronics and mechanical engineering).

It also encompasses the fields of robotics and neuroscience. Biomechatronic devices encompass a wide range of applications from the development of prosthetic limbs to engineering solutions concerning respiration, vision, and the cardiovascular system.

Bio-Mechatronics is the integration of biological components with artificial devices, in which the biological component confers a significant functional capability to the system, and the artificial component provides specific cellular and tissue interfaces that promote the maintenance and functional adaptation of the biological component. Based upon functional performance, muscle is potentially an excellent mechanical actuator, but the larger challenge of developing muscle-actuated, biomechatronic devices poses many scientific and engineering challenges.

Course Duration: 30 Hrs.

Detailed Syllabus

Pre-requisites: Knowledge of Materials and their properties used in Manufacturing process Basic Knowledge of Electrical, Electronics, Mechanics and Biology.

Course Outcomes: At the end of the course, the student will be able to:

CO1	Explain the motivation, ethical issues and future challenges in bio-mechatronics.
CO2	Analyze the design and construction of biomechatronic technologies.
CO3	Evaluate the design and construction of biomechatronic technologies.
CO4	Apply appropriate dynamic models and computational tools to simulate and analyze biomechatronic systems.
CO5	Design simple biomechatronic systems using appropriate hardware instrumentation and end user.

Course Contents

Module 1 Introduction to Bio-mechatronics: clinical examples, highlights of technology, ethical issues and course outline. Nervous and muscular systems: the nervous system as a controller, sensory systems of the body, neurons and action potentials, muscles as actuators.

Module 2 Mechanics and materials: the body in motion, mechanical properties of tissues, mechanical analysis of body parts and their motion, materials and their properties for biomechatronic engineering.

Module 3 Electrodes: applications of electrodes, recording and stimulation of bioelectronic signals, electrode-tissue interface.

Module 4 Sensors, power sources and control: covering a range of sensors, power sources and control strategies used in bio-mechatronics. Prosthetic electronic skins.

Module 5 Bioprinting: 3D printing technologies in biomedicine, Signals: signal acquisition, processing and analysis. Filters, ADC and amplification of bioelectronic signals.

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EDUCATION EMPOWERS

Certification Course

on

Cyber Security (CCCS 04)

Offered by

School of Computer Science and Engineering

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Why take up this course?

- To gain the ability to define the design, architecture, and management of an organization's security
- To perform data loss prevention and risk analysis
- To acquire an understanding of the security architecture, models, engineering, and cryptography
- To get familiar with network security and communications, identity and access management, operations, and security testing

Career Prospects of this course

- IT Directors
- IT Security Consultants
- Security Auditors
- IT Managers
- Security Analysts
- Directors of Security
- Security Managers
- Network Architects
- Security Systems Engineers
- Security Architects
- Chief Information Security Officers

Program Curriculum

Cyber Security Training Course Content

1. **SECURITY AND RISK MANAGEMENT**
    - Regulatory and legal issues
    - Confidentiality, availability, and integrity concepts
    - Principles of security governance
    - Compliance and professional ethics
    - Requirements of business continuity
    - Policies of personnel security
    - Threat modeling and risk considerations
    - Security education, awareness, and training
    - Security policies, standards, procedures, and guidelines
2. **ASSET SECURITY**
    - Privacy protection
    - Asset and information classification
    - Ownership
    - Data security controls and appropriate retention
    - Requirements handling
3. **SECURITY ARCHITECTURE AND ENGINEERING**
    - Security evaluation models
    - Fundamental concepts of security models
    - Security designs, architectures, and solution elements vulnerabilities

- Information systems security capabilities
- Using secure design principles for engineering processes
- Vulnerabilities of web-based and mobile systems
- Cryptography
- Vulnerabilities of cyber-physical systems and embedded devices
- Secure principles of facility and site design
- Physical security

4. COMMUNICATION AND NETWORK SECURITY

- Architectural design of a secure network
- Channels for secure communication
- Components of a secure network
- Network attacks

5. IDENTITY AND ACCESS MANAGEMENT (IAM)

- Logical/physical access to assets management
- Authentication and identification management
- Integrating identity as a third-party service
- Mechanism of authorization
- Provisioning life cycle's identity and access

6. SECURITY ASSESSMENT AND TESTING

- Test outputs (e.g., manual and automated)
- Security process data (e.g., operational and management controls)
- Vulnerabilities of security architectures
- Testing of security control
- Test and assessment strategies

7. SECURITY OPERATIONS

- Monitoring and logging activities
- Investigation requirements and support
- Incident management
- Resource provision
- Concepts of foundational security operations
- Recovery strategies
- Techniques of resource protection
- Physical security
- Measures of prevention
- Vulnerability and patch management
- Processes of change management
- Exercises and planning of business continuity
- Personnel safety concerns
- Plans and processes for disaster recovery

8. SOFTWARE DEVELOPMENT SECURITY

- Security controls for development environment
- Software development life cycle security
- Impact of acquired software security
- Effectiveness of software security

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EDUCATION EMPOWERS

Certification Course

on

Digital Marketing (CCBS 02)

Offered by

School of Business Studies

Shobhit Institute of Engineering and Technology

(Deemed to be University)

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Digital Marketing

Overview:
In simple terms, digital marketing is the promotion of products or brands via one or more forms of electronic media. Digital marketing is often referred to as online marketing, internet marketing or web marketing.

Duration: 40 Hrs.

Course Objectives:

Digital marketing objectives should be SMART (Specific, Measurable, Achievable, Relevant and Time Related); and you should benchmark against your competitors to ensure that you are more effective.

Pre-requisite / Target Audience:

- No prior knowledge about marketing or digital marketing is required
- Speak and write English fluently
- Have broadband internet access
- Have basic PC skills and online access
- Be over the age of 18
- Be fully committed to Squared!

Module 1: Introduction to Digital Marketing:

In this module you will learn what is digital marketing, and importance of digital marketing. And you will also learn what is web site and levels of web site, Difference between blog, portal & website.

- What is digital marketing?
- How is it different from traditional marketing?
- ROI between Digital and traditional marketing?
- Discussion on Ecommerce
- Discussion on new trends and current scenario of the world?
- Digital marketing a boon or a Bane?
- How can digital marketing be a tool of success for companies?
- Video on importance of digital marketing
- Analysis of recent info graphics released by companies about digital marketing?
- How did digital marketing help the small companies and top inc
- Categorization of digital marketing for the business
- Diagnosis of the present website and business.

- Swot analysis of business, present website and media or promotion plan.
- Setting up vision,mission,and goals of digital marketing

Understanding a website

- What is a website?
- Levels of websites?
- Diff b/w Blog, Portal and Website?
- Diff b/w websites either static or dynamic

Module 2: Search Engine Optimization (SEO):

In this module you will learn complete about SEO (Search engine Optimization, what is On page optimization, Off page optimization, and you also learn how to prepare a reports like- Keywords, titles, meta tags etc..

- On page optimization techniques
- Off page Optimization techniques
- Reports

Module 3: Social Media Optimization (SMO):

In this module you will learn how to do SMO (Social Media Optimization) like Facebook, Twitter, LinkedIn, Tumblur, Pinterest and more social media services optimization.

- Introduction to social Media Marketing
- Advanced Facebook Marketing
- Word Press blog creation
- Twitter marketing
- LinkedIn Marketing
- Google plus marketing
- Social Media Analytical Tools

Module 4: Search Engine Marketing:

In this module you will learn what SME (Search Engine Marketing) is a paid tool like Google Adwords, now a days we have so many paid tools we discuss is briefly and display advertising techniques and all.

- Introduction to Search Engine Marketing
- Tools used for Search engine Marketing
- PPC /Google Adwords Tool
- Display advertising techniques
- Report generation

Module 5: Additional Module:

In this module you will learn about tools for more useful to SEO, these tool used for analysis on website traffic, keyword analysis and also you can learn Email marketing and all.

- Google Analytics
- Online Reputation Management
- E-Mail Marketing
- Affiliate Marketing
- Social Media Analytics
- Ad designing

At the end of the course participants will be able to

1. Online & Offline SEO
2. Competitive Analysis For Smarter Marketing
3. You will learn how to use dozens of proven digital marketing strategies
4. You will learn how to use all of the most popular social media platforms to grow your business
5. You will see tangible results by taking action throughout the entire course
6. You will increase conversions and sales with real world techniques
7. You will improve your brand identity and grow your brand's audience

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EDUCATION EMPOWERS

Certification Course

on

Ethical Hacking (CCCS 03)

Offered by

School of Computer Science and Engineering

Shobhit Institute of Engineering and Technology

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Who is a Certi ied Ethical Hacker?

A Certified Ethical Hacker is a specialist typically working in a red team environment, focused on attacking computer systems and gaining access to networks, applications, databases, and other critical data on secured systems. A CEH understands attack strategies, the use of creative attack vectors, and mimics the skills and creativity of malicious hackers. Unlike malicious hackers and actors, Certified Ethical Hackers operate with permission from the system owners and take all precautions to ensure the outcomes remain confidential. Bug bounty researchers are expert ethical hackers who use their attack skills to uncover vulnerabilities in the systems.

Course Description

The Certified Ethical Hacker (CEH) credential is the most trusted ethical hacking certification and accomplishment recommended by employers globally. It is the most desired information security certification and represents one of the fastest-growing cyber credentials required by critical infrastructure and essential service providers. Since the introduction of CEH in 2003, it is recognized as a standard within the information security community. CEH v11 continues to introduce the latest hacking techniques and the most advanced hacking tools and exploits used by hackers and information security professionals today. The Five Phases of Ethical Hacking and the original core mission of CEH remain valid and relevant today: "To beat a hacker, you need to think like a hacker."

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Certi ied Ethical Hacker (CEH) Version 11

CEH provides an in-depth understanding of ethical hacking phases, various attack vectors, and preventative countermeasures. It will teach you how hackers think and act maliciously so that you will be better positioned to set up your security infrastructure and defend future attacks. Understanding system weaknesses and vulnerabilities help organizations strengthen their system security controls to minimize the risk of an incident.

CEH was built to incorporate a hands-on environment and systematic process across every ethical hacking domain and methodology, giving you the opportunity to work towards proving the required knowledge and skills needed to perform the job of an ethical hacker. You will be exposed to an entirely different posture towards the responsibilities and measures required to be secure.

In its 11th version, CEH continues to evolve with the latest operating systems, tools, tactics, exploits, and technologies. Here are some critical updates of CEH v11:

Incorporating Parrot Security OS

When compared to Kali Linux, Parrot Security OS offers better performance on lower-powered laptops and machines while offering an intuitive look and feel with a larger repository of general tools.

Re-Mapped to NIST/NICE Framework

CEH v11 is mapped rigorously to important Specialty Areas under the NIST/NICE framework's Protect and Defend (PR) job role category overlapping with other job roles, including Analyze (AN) and Securely Provision (SP).

Enhanced Cloud Security, IoT, and OT Modules

CEH v11 covers updated Cloud and IoT modules to incorporate CSP's Container Technologies (e.g., Docker, Kubernetes), Cloud Computing threats, and a number of IoT hacking tools (e.g. Shikra, Bus Pirate, Facedancer21, and more). This is critical as the world moves towards broader and deeper cloud adoptions.

Cloud-Based Threats

As the cloud industry is estimated to reach $354 billion by 2022, the businesses struggle to limit the frequency of data theft incidents due to misconfigured cloud environments. January to April 2020 alone saw a 630% spike in cloud-based attacks. Learn how to avoid, identify, and respond to cloud-based attacks with CEH v11.

IoT Threats

Market reports anticipate that the worldwide IoT-connected devices are expected to reach 43 billion by 2023. To support this rapid expansion, the prominent players of the internet, including Amazon Web Services, Google, IBM, Microsoft, are swiftly shifting to private cloud services, creating complexities in IoT ecosystems. Learn to deal with IoT-based attacks with the CEH v11 course that covers the latest IoT hacking tools, such as Shikra, Bus Pirate, Facedancer21, and many others.

Operational Technology (OT) Attacks

Last year, businesses experienced a 2,000% increase in OT based incidents. You can gain expertise in OT, IT, and IIoT (industrial IoT) to secure a critical enterprise OT/IoT deployments. To learn the advanced skills of OT, CEH covers concepts of OT, such as ICS, SCADA, and PLC, various challenges of OT, OT hacking methodology, tools, communication protocols of an OT network like Modbus, Profinet, HART-IP, SOAP, CANopen, DeviceNet, Zigbee, Profibus, etc., and gaining Remote Access using DNP3 protocol.

Modern Malware Analysis

CEH v11 now includes the latest malware analysis tactics for ransomware, banking and financial malware, IoT botnets, OT malware analysis, Android malware, and more!

Covering the Latest Threats - Fileless Malware

As the security community observed a rise in fileless attacks, it began to raise concerns about fileless malware attacks. As fileless malware is a relatively new form of malware attack, organizations find it difficult to detect with endpoint security solutions. With the CEH v11, you can now learn various fileless malware techniques with associated defensive strategies, as the course focuses on the taxonomy of fileless malware threats, fileless malware obfuscation techniques to bypass antivirus, launching fileless malware through script-based injection, launching fileless malware through phishing, and more.

New Lab Designs and Operating Systems

This latest iteration of CEH v11 includes new operating systems, including Windows Server 2019, Windows Server 2016, and Windows 10 configured with Domain Controller, firewalls, and vulnerable web applications for practicing and improving hacking skills.

Increased Lab Time and Hands-on Focus

More than 50% of the CEH v11 course is dedicated to practical skills in live ranges via EC-Council labs. EC-Council leads in this aspect of the industry.

Industry's Most Comprehensive Tools Library

The CEH v11 course includes a library of the latest tools required by security practitioners and pen testers across the world.

Course Outline

Module 01	Introduction to Ethical Hacking
Module 02	Footprinting and Reconnaissance
Module 03	Scanning Networks
Module 04	Enumeration
Module 05	Vulnerability Analysis
Module 06	System Hacking
Module 07	Malware Threats
Module 08	Sniffing
Module 09	Social Engineering
Module 10	Denial-of-Service
Module 11	Session Hijacking
Module 12	Evading IDS, Firewalls, and Honeypots
Module 13	Hacking Web Servers
Module 14	Hacking Web Applications
Module 15	SQL Injection
Module 16	Hacking Wireless Networks
Module 17	Hacking Mobile Platforms
Module 18	IoT and OT Hacking
Module 19	Cloud Computing
Module 20	Cryptography

What You Will Learn ?

- Key issues include plaguing the information security world, ethical hacking, information security controls, laws, and standards.
- Perform footprinting and reconnaissance using the latest footprinting techniques and tools as a critical pre-attack phase required in ethical hacking.
- Network scanning techniques and scanning countermeasures.
- Enumeration techniques and enumeration countermeasures.
- Vulnerability analysis to identify security loopholes in the target organization's network, communication infrastructure, and end systems.
- System hacking methodology, steganography, steganalysis attacks, and covering tracks to discover system and network vulnerabilities.
- Different types of malware (Trojan, Virus, worms, etc.), system auditing for malware attacks, malware analysis, and countermeasures.
- Packet sniffing techniques to discover network vulnerabilities and countermeasures to defend sniffing.
- Social engineering techniques and how to identify theft attacks to audit human-level vulnerabilities and suggest social engineering countermeasures.
- DoS/DDoS attack techniques and tools to audit a target and DoS/DDoS countermeasures.
- Session hijacking techniques to discover network-level session management, authentication/authorization, cryptographic weaknesses, and countermeasures.
- Web server attacks and a comprehensive attack methodology to audit vulnerabilities in web server infrastructure, and countermeasures.
- Web application attacks and comprehensive web application hacking methodology to audit vulnerabilities in web applications, and countermeasures.
- SQL injection attack techniques, injection detection tools to detect SQL injection attempts, and countermeasures.
- Wireless encryption, wireless hacking methodology, wireless hacking tools, and Wi-Fi security tools.
- Mobile platform attack vector, android vulnerability exploitations, and mobile security guidelines and tools.
- Firewall, IDS and honeypot evasion techniques, evasion tools and techniques to audit a network perimeter for weaknesses, and countermeasures.
- Cloud computing concepts (Container technology, serverless computing), various threats/attacks, and security techniques and tools.
- Penetration testing, security audit, vulnerability assessment, and penetration testing roadmap.
- Threats to IoT and OT platforms and learn how to defend IoT and OT devices securely.
- Cryptography ciphers, Public Key Infrastructure (PKI), cryptography attacks, and cryptanalysis tools.

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Target Audience

- Information Security Analyst / Administrator
- Information Assurance (IA) Security Officer
- Information Security Manager / Specialist
- Information Systems Security Engineer / Manager
- Information Security Professionals / Officers
- Information Security / IT Auditors
- Risk / Threat/Vulnerability Analyst
- System Administrators
- Network Administrators and Engineers

Suggested Course Duration

Minimum Hours: 40

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Certification Course

on

Internet of Things (CCCS 02)

Offered by

School of Computer Science and Engineering

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Certificate Course in Internet of Things (IOT) Using Arduino

Objective of the Course:

This Course focuses on hands-on IoT concepts such as sensing, actuation and communication. It covers the development of Internet of Things (IoT) prototypes—including devices for sensing, actuation, processing, and communication—to help you develop skills and experiences. The Internet of Things (IOT) is the next wave, world is going to witness. Today we live in an era of connected devices the future is of connected things.

Learning Outcome:

After the completion of the course, the students will be able design some IOT based prototypes

Duration of the Course: 60 Hrs.

Minimum Eligibility Criteria:

Pursuing/Passed BE/B.Tech/BCA/BSc.

COURSE OUTLINE

Sr. No.	Modules to be Covered
1	Introduction to IOT
2	Simulation Environment
3	Sensor & Actuators with Raspberry Pi
4	Basic Networking with Wi-Fi module
5	IoT Protocols
6	Cloud Platforms for IOT

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Contents to be covered

Module 1

Introduction to IoT: Architectural Overview, Design Principles and needed capabilities, IoT Applications, Sensing, Actuation, Basics of Networking, M2M and IoT technology Fundamentals, Devices and Gateways, Data management, Business Processes in IoT, Everything as a Service (XaaS), Role of cloud in IoT, Security aspects in IoT

Module 2

Elements of IoT: Hardware components- Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, i/O Interfaces, Software Components-Programming API's (using Python/Node js/Arduino) for Communication Protocols-MQTT, Zigbee, Bluetooth, CoAP, UDP, TCP.

Module 3

IoT Application Development: Solution framework for IoT Applications, Implementation of device integration, Data acquisition and integration, Device data storage-Unstructured data storage on cloud/local server, Authentication, Authorization of devices.

Module 4

IoT case Studies: IoT Case studies and mini projects based on Industrial automation, Transportation, Agriculture, Healthcare, Home automation

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EDUCATION EMPOWERS

Certification Course

on

Intellectual Property Rights

(CCLW 01)

Offered by

School of Law and Constitutional Studies

Shobhit Institute of Engineering and Technology

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Background

Indian Law Institute (ILI) has been the pioneer in the field of teaching and training of intellectual property laws and cyber laws. After having established a sound framework for the classroom teaching in these fields, we now plan to traverse the virtual world to embark on e-education.

By e-education is meant an innovative, on-line teaching technique for distance learning that utilizes the Internet for teaching purposes. E-education would bring teachers specializing in intellectual property issues closer to students in all corners of India through virtual means. This method allows students to undertake the ILI educational programs in intellectual property at their own place anywhere in India.

The Institute would use distance learning as an alternative and a complement to traditional training methods in order to make course materials accessible to large audiences throughout India.

About the course

Development of IPR is a recent phenomenon. It is still in a nascent stage and continuously evolving every passing day. Even the most learned legal luminaries find it difficult to solve the legal problems posed by technology. The Online Certificate Course offered by the institute, intends to spread awareness among the general public about the IPR, it is specifically beneficial to the lawyer community and the judges in the subordinate judiciary, who face cases on the daily basis.

The course is designed to give distant education wherein the students need not come to the institute for either classes or examination. The course will be conducted online and the subscribers need to operate from their respective places. All the queries of the subscribers relating to the admission or the conduct will be answered online.

Teaching procedure

The Institute's initiative takes full advantage of information technology and the Internet as an alternative and a complement to traditional training programs. It offers new teaching methodologies, specially-designed course materials, evaluation tools, tailored means of delivery, and greater accessibility.

Teaching would take place in the virtual environment of the Institute's Web site. A network of tutors on the panel of ILI will be available to guide the students. Students and teachers can interact as often as necessary during the course, because communication takes place through e-mail.

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At the end of the program, successful students receive a certificate acknowledging completion of the course.

Things that would take place on-line in the course:

- Registration
- Student-teacher interaction
- Student tests and assignments
- Course monitoring
- Evaluation

Who can pursue?

It is a general course which would be of immense value to persons who fall in the following categories:

- Students
- Lawyers
- Law enforcement personnel - customs officials, police officials, etc.
- Patent agents
- Intellectual Property Offices in Government Sector
- Engineers
- Scientists
- Software Professionals
- Company Executives
- Economists
- Journalists
- Government Officials

Syllabus

The syllabus is divided in four components:

- Patents
- Copyright and neighbouring rights
- Trademarks, Geographical Indications and Domain Names
- Management of Intellectual Property Rights

Duration

40 Hrs.

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Detailed Syllabus

Objectives:

- To introduce fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.
- To disseminate knowledge on patents, patent regime in India and abroad and registration aspects
- To disseminate knowledge on copyrights and its related rights and registration aspects
- To disseminate knowledge on trademarks and registration aspects
- To disseminate knowledge on Design, Geographical Indication (GI), Plant Variety and Layout Design Protection and their registration aspects
- To aware about current trends in IPR and Govt. steps in fostering IPR

Unit 1	Intellectual Property Rights: An overview	
Introduction and the need for intellectual property right (IPR) - Kinds of Intellectual Property Rights: Patent, Copyright, Trade Mark, Design, Geographical Indication, Plant Varieties and Layout Design – Genetic Resources and Traditional Knowledge – Trade Secret - IPR in India : Genesis and development – IPR in abroad - Major International Instruments concerning Intellectual Property Rights: Paris Convention, 1883, the Berne Convention, 1886, the Universal Copyright Convention, 1952, the WIPO Convention, 1967,the Patent Co-operation Treaty, 1970, the TRIPS Agreement, 1994		
Unit 2	**Patents**	
Patents - Elements of Patentability: Novelty, Non-Obviousness (Inventive Steps), Industrial Application - Non - Patentable Subject Matter - Registration Procedure, Rights and Duties of Patentee, Assignment and licence, Restoration of lapsed Patents, Surrender and Revocation of Patents, Infringement, Remedies & Penalties, Patent office and Appellate Board		

Unit 3	Copyrights	
Nature of Copyright - Subject matter of copyright: original literary, dramatic, musical, artistic works; cinematograph films and sound recordings - Registration Procedure, Term of protection, Ownership of copyright, Assignment and licence of copyright - Infringement, Remedies & Penalties – Related Rights - Distinction between related rights and copyrights		
Unit 4	**Trademarks**	
Concept of Trademarks - Different kinds of marks (brand names, logos, signatures, symbols, well known marks, certification marks and service marks) - Non-Registrable Trademarks - Registration of Trademarks - Rights of holder and assignment and licensing of marks - Infringement, Remedies & Penalties - Trademarks registry and appellate board		
Unit 5	**Other types of IP**	
Design Design: meaning and concept of novel and original - Procedure for registration, effect of registration and term of protection **Geographical Indication (GI)** Geographical indication: meaning, and difference between GI and trademarks - Procedure for registration, effect of registration and term of protection **Plant Variety Protection** Plant variety protection: meaning and benefit sharing and farmers' rights – Procedure for registration, effect of registration and term of protection **Layout Design Protection** Layout Design protection: meaning – Procedure for registration, effect of registration and term of protection		
Unit 6	**Current Regime & Scenario**	
India`s New National IP Policy, 2016 – Govt. of India step towards promoting IPR – Govt. Schemes in IPR – Career Opportunities in IP - IPR in current scenario with case studies		

Course Outcomes:

- The students once they complete their academic projects, shall get an adequate knowledge on patent and copyright for their innovative research works
- During their research career, information in patent documents provide useful insight on novelty of their idea from state-of-the art search. This provides further way for developing their idea or innovations
- Pave the way for the students to catch up Intellectual Property (IP) as a career option
    a. R&D IP Counsel
    b. Government Jobs – Patent Examiner
    c. Private Jobs
    d. Patent agent and Trademark agent
    e. Entrepreneur

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Certification Course

on

Linux Fundamentals

(CCCS 01)

Offered by

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Linux Course Curriculum

Introduction to Linux

Learning Objective: In this module, you will be introduced to various features of Linux. You will learn history, open source licences, various Linux distributions and Linux installation

Topics:

- Need for Linux OS
- What is Linux
- History of Linux
- Relationship Between Unix And Linux
- Features of Linux
- False myths around Linux
- Where Linux is used?
- Components of a Linux OS
- The architecture of Linux OS
- Types of Kernel
- Shell
- Programming in Linux
- Linux Distribution
- Miscellaneous Linux Concepts
- Software Licencing
- Installation and initialisation of Linux
- Shell Scripting
- Practical Uses of Shell Scripting

Initialization of Linux

Learning Objective: In this module, you will understand the user interface, commands and tools, and file operations in Linux

Topics:

- Understand User Interface in Linux
- Implement basic Linux Commands and Tools
- vim Editor
- Advanced Linux Commands
- File System
- File System Comparisons
- File Attributes
- File Operations
- File System Characteristics
- File Access Methods
- Formatting and Partitioning
- Multiboot System
- Learn Packaging Management in Linux

Hands On/Demo:

- Linux Commands
- Vim Editor
- Creating partitions

User Administration

Learning Objective: In this module, you will learn about managing Users and perform Authentication

Configuration

Topics:

- Users in Linux
- User Configuration
- Adding/Deleting/Modifying Users
- Group Administration
- Password Aging Policies
- Switching Accounts
- Sudo
- Network Users
- Authentication Configuration
- SUID and SGID Executable
- SGID Directories
- The Sticky Bit
- Default File Permissions
- Access Control Lists (ACLs)
- Hidden Files

Hands On/Demo:

- Demo – sudo, chown and chmod
- Adding a user
- Delete user
- Modify user
- Hidden Files

Boot and Package Management

Learning Objective: In this module, you will learn about the boot management system and configuring services to run at boot. You will understand package management, which includes installing and removing software and updating a Kernel RPM.

Topics:

- Kernel Configuration
- Boot Management
- Grub Bootloader Configurations
- Red Hat Package Manager
- YUM
- DPKG
- APT
- Build from the source code
- Libraries

Hands On/Demo:

- Sysctl
- Bootloader Configurations
- Red Hat Package Manager
- YUM
- DPKG
- APT

Networking

Learning Objective: In this module, you will learn about OSI layers and various protocols of networking in Linux

Topics:

- OSI layers and Protocols: IPv4, IPv6, TCP, UDP, FTP, TFTP, Telnet, SSH, HTTP, DNS, DHCP, ARP, ICMP etc.
- Packet capturing tools
- Linux commands/tools to troubleshoot networking: netstat, tcpdump, ip, etc.
- Linux utilities: e.g. dnsmasqd, samba server ftpd, webserver, netcat, scp etc.
- Linux Firewall: command, utility and usage.
- Security: SSH, SCP. Certificates, authentication, encryption etc.
- Remote log in: SSH, screen, VNC, etc.

Hands On/Demo:

- IP addresses
- DNS
- ICMP
- dnsmasq.conf
- IP tables

Linux Overview and Scripting

Learning Objective: In this module, you will learn process management, system calls and bash operations

Topics:

- Process Management
- Process Commands
- System Calls
- Output Redirection
- Special Variables in Bash
- Expect Script

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- Python Scripting
- Dictionaries

Hands On/Demo:

- Ps command
- Top command
- Kill command
- Expect

Linux for software development

Learning Objective: In this module, you will learn about programming languages, libraries and profiling tools

Topics:

- Programming languages overview
- Static and Shared libraries
- Compilers, debugger, IDE, ctags, make utility etc.
- Editors in Linux: vi, emacs,
- Troubleshooting and optimization using profiling tools
- Diff, patch and Configuration management system
- Test automation and CI/CD pipeline

Hands On/Demo:

- Libraries
- Makefile

Security Administration, Shell Script and Virtualization

Learning Objective: In this module, we will learn about Linux security administration and Virtualization

Topics:

- Security in IT Industry
- SELinux
- Information gathering tools
- Grub security
- TCP Wrappers
- Securing Shell
- ClamAV
- Virtualization

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Certification Course

on

MATLAB from beginner to advance level (CCEC 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

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Basic Course Description

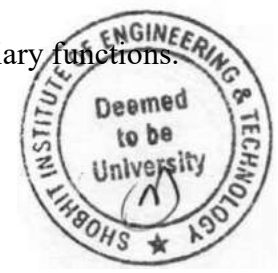
MATLAB (matrix laboratory) is one of the fundamental and leading programming languages and is a must learn skill for anyone who want to develop a career in engineering, science or related fields. Excellent **MATLAB programming skills** is therefore a crucial factor in making or breaking your career.

Duration: 40 Hrs.

This MATLAB course is one of the **most comprehensive MATLAB** courses which will take from **beginner to professional**. This course is designed from a perspective of a student who has **no prior knowledge of MATLAB and who is a MATLAB beginner.**

Throughout this comprehensive course, we cover a massive number of skills and techniques including:

- Basic mathematics and matrix manipulation functions
- Data import and visualization
- MATLAB Programming, problem solving, logic development and the use of customized functions
- Symbolic functions and variables for advance math operations
- File and directory handling
- Live scripts and sharing of results
- Advance data types including cells, tables, time tables and map containers
- Data science classification, clustering and dimensionality reduction with MATLAB
- Essential data preprocessing tasks such as outliers, missing values, categorical attributes handling
- Building regular expressions for textual processing
- Building GUIs using Guide and AppDesigner.
- Automating tasks by controlling mouse, keyboard, running scripts from command window, batch files
- Web, email and other internet related operations
- Generating ppts, word files and pdfs
- Code debugger and analyzer, exception handling, startup, finish and diary functions.



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What you'll learn

- Develop beginner to advance level skills of Programming with MATLAB. This is the only course which enables you to learn intermediate and advance programming data structures such as structures, tables, times tables, cells and map container.
- Gain Hands-On experience with MATLAB for visualizing, analyzing and formulating intermediate and some advanced level problems using MATLAB programming skills
- Experience some real-world applications of MATLAB in solving Data Science problems.

Requirements

- We cover everything from scratch and therefore do not require any prior knowledge of MATLAB
- The installation of MATLAB software on your machine is a must for this course so that you are able to run the commands and scripts that we cover during the course. If you do not have the MATLAB software installed than you may consider the following options
- 1. You may download a free trail copy of the software from the MATHWORK website. This is for limited time use
- 2. If you are student or employee, you may contact your School or employer for a free copy. Many universities offer a free student version of the software
- 3. You may consider downloading the Octave which is a free and has nearly identical functionality as that of MATLAB. (I would not recommend this option since you may not be able to have access to all the functions that we cover in this course)
- 4. If none of the above works for you, then you may purchase the student version directly from MathWorks website which is significantly lower in cost compare to its full version.

Basic Course Description

MATLAB (matrix laboratory) is one of the fundamental and leading programming language and is a must learn skill for anyone who want to develop a career in engineering, science or related fields. Excellent **MATLAB programming skills** is therefore a crucial factor in making or breaking your career.

This course is designed from a perspective of a student who has **no prior knowledge of MATLAB.** The course starts from the very basic concepts and then built on top of those basic concepts and move towards more advanced topics such as **visualization**, exporting and importing of data, **advance data types** and **data structures** and advance programming constructs.

To get the real feel of MATLAB in solving and analyzing real life problems, the course includes **machine learning topics in data science and data preprocessing.**

The course is fun and exciting, but at the same time we dive deep into MATLAB to uncover its power of formulating and analyzing real life problems. The course is structured into four different Parts. Below is the detailed outline of this course.

Part 1: MATLAB from Beginner to Advance

Segment 1.1: Handling variables and Creating Scripts

Segment 1.2: Doing Basic Mathematics in MATLAB

Segment 1.3: Operations on Matrices

Segment 1.4: Advance Math Functions with Symbolic Data Type

Segment 1.5: Interacting with MATLAB and Graphics

Segment 1.6: Importing Data into MATLAB

Segment 1.7: File Handling and Text Processing

Segment 1.8: MATLAB Programming

Segment 1.9: Sharing Your MATLAB Results

Part 2: Advance MATLAB Data Types

Segment 2.1: Cell Data Type

Segment 2.2: Tables and Time Tables

Segment 2.3: Working with Structures and Map Container Data Type

Segment 2.4: Converting between Different Data Types

Part 3: Machine Learning for Data Science Using MATLAB

Segment 3.1 Data Preprocessing

Segment 3.2. Classification

Segment 3.2.1 K-Nearest Neighbor

Segment 3.2.2 Naive Bayes

Segment 3.2.3 Decision Trees

Segment 3.2.4 Support Vector Machine

Segment 3.2.5 Discriminant Analysis

Segment 3.2.6 Ensembles

Segment 3.2.7 Performance Evaluation

Segment 3.3 Clustering

Segment 3.3.1 K-Means

Segment 3.3.2 Hierarchical Clustering

Segment 3.4 Dimensionality Reduction

Segment 3.5 Project

Part 4: Data Preprocessing for Machine Learning using MATLAB

Segment 4.1 Handing Missing Values

Segment 4.2 Dealing with Categorical Variables

Segment 4.3 Outlier Detection

Segment 4.4 Feature Scaling and Data Discretization

Segment 4.5 Selecting the Right Method for your Data

Who this course is for:

- Anyone looking to build a strong career in science or engineering through Excellent MATLAB coding skills
- Anyone wanting to advance their skills of real-world problem solving with MATLAB based scientific computing

By taking this course, you will become a **fluent** MATLAB programmer and you'll be so good so that you can get a reasonable job offer as a MATLAB developer and use the language professionally.

Shobhit
Institute of Engineering & Technology
Deemed to-be-University
EDUCATION EMPOWERS

Certification Course

on

Personality Development and Soft Skills (CCBS 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

(Deemed to be University)

Registrar
Shobhit Institute of Engg. & Tech.
(Deemed to-Be University)
NH-58, Modipuram, Meerut-250110

SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

Personality Development and Soft Skills

INTENDED AUDIENCE : Students, Teachers, Professionals, Trainers, Leaders, Employers

DURATION: 40 Hrs.

INDUSTRIES APPLICABLE TO: All industries/companies/organizations will recognize and value this course and recommend this for their employees and trainee programs.

COURSE OUTLINE :

The course aims to cause a basic awareness about the significance of soft skills in professional and inter-personal communications and facilitate an all-round development of personality. Hard or technical skills help securing a basic position in one's life and career. But only soft skills can ensure a person retain it, climb further, reach a pinnacle, achieve excellence, and derive fulfilment and supreme joy. Soft skills comprise pleasant and appealing personality traits as self-confidence, positive attitude, emotional intelligence, social grace, flexibility, friendliness and effective communication skills.

COURSE PLAN :

Week 01 : Introduction: A New Approach To Learning, Planning And Goal-Setting, Human Perceptions: Understanding People, Types of Soft Skills: Self-Management Skills, Aiming For Excellence: Developing Potential And Self-Actualisation, Need Achievement And Spiritual Intelligence.

Week 02 : Conflict Resolution Skills: Seeking Win-Win Solution, Inter-Personal Conflicts: Two Examples, Two Solutions, Types of Conflicts: Becoming A Conflict Resolution Expert, Types of Stress: Self-Awareness About Stress, Regulating Stress: Making The Best out of Stress.

Week 03 : Habits: Guiding Principles, Identifying Good And Bad Habits, Habit Cycle; Breaking Bad Habits, Using The Zeigarnik Effect For Productivity And Personal Growth, Forming Habits of Success.

Week 04 : Communication: Significance Of Listening, Active Listening, Barriers To Active Listening; Telephone Communication: Basic Telephone Skills, Advanced Telephone Skills, Essential Telephone Skills.

Week 05 : Technology And Communication: Technological Personality?, Mobile Personality?, E-Mail Principles, How Not To Send E-Mails!, Netiquette, E-Mail Etiquette.

Week 06 : Communication Skills: Effective Communication, Arising Out Of Sender/Receiver's Personality; Barriers To Communication: Interpersonal Transactions, Miscommunication; Non-Verbal Communication: Pre-Thinking Assessment-1 & 2.

Week 07 : Nonverbal Communication: Introduction And Importance, Issues And Types, Basics And Universals, Interpreting Non-Verbal Cues; Body Language: For Interviews, For Group Discussions.

Week 08 : Presentation Skills: Overcoming Fear, Becoming A Professional, The Role Of Body Language, Using Visuals, Reading Skills: Effective Reading, Human Relations: Developing Trust And Integrity.

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EDUCATION EMPOWERS

Certification Course

on

Retail Management (CCBS 03)

Offered by

School of Business Studies

Shobhit Institute of Engineering and Technology
(Deemed to be University)

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NH-58, Modipuram, Meerut-250110

Retail Management

Certification Code

This integrated certificate course in retail management, concentrates on the Retail sector's emerging and the most prevalent trends. The Retail world's most crucial aspects like Category Management, Retail Buying, Store Operations, Customer Marketing and Retail Strategies have been rightly explored. This may help individuals embark on a career in one of the many roles in the Retail industry.

Why should one take this certification?

This Course is intended for professionals and graduates wanting to excel in their chosen areas. It is also well suited for those who are already working and would like to take certification for further career progression.

Earning Vskills Retail Management Professional Certification can help candidate differentiate in today's competitive job market, broaden their employment opportunities by displaying their advanced skills, and result in higher earning potential.

Who will benefit from taking this certification?

Job seekers looking to find employment in retail departments of various companies, students generally wanting to improve their skill set and make their CV stronger and existing employees looking for a better role can prove their employers the value of their skills through this certification.

Course Duration

30 Hrs.

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Table of Contents

7. The Demand-Driven Supply Chain

7.1 Vision for The Demand-Driven Supply Chain
7.2 The Path From Forecast-Driven To Demand-Driven Supply Chain
7.3 Demand-Driven Tools And Techniques
7.4 Sponsoring The Demand-Driven Supply Chain

8. Product Tracking Along Retail Supply Chains

8.1 Introduction
8.2 Low Tech Retailing
8.3 Beyond Basic Bar Codes
8.4 Radio Frequency Identification
8.5 Tracking In Transit
8.6 The Future Of Product Tracking

9. Understanding Supply Chain Costs

9.1 Introduction
9.2 Barriers To Cost Visibility
9.3 Goal: Activity-Based Costing By Product
9.4 The Starting Point (i-a)
9.5 Department Costs With Capital Recovery (ii-b)
9.6 Multicompany Process Cost (iii-c)
9.7 Activity-Based Costs By Product (iv-d)
9.8 Understanding costs—summary

10. Retail Return

10.1 Introduction
10.2 Genco Case Study—The Rise Of The Return Loop
10.3 Types of Returns
10.4 Opportunities In Returns

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EDUCATION EMPOWERS

Certification Course

on

Solar Power Technology

(CCEE 01)

Offered by

School of Electronics, Electrical and Mechanical Engineering

Shobhit Institute of Engineering and Technology

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SHOBHIT INSTITUTE OF ENGINEERING & TECHNOLOGY
Deemed to be University

SOLAR POWER TECHNOLOGY

PRE-REQUISITES : Basic knowledge of heat transfer, thermodynamics and fundamentals of physics

COURSE DURATION: 35 Hrs.

INTENDED AUDIENCE : UG, PG and Doctorate students

INDUSTRIES APPLICABLE TO : This course will be very much effective for the engineers working in the Solar Industries

COURSE OUTLINE :

The course content is designed to provide comprehensive knowledge on solar radiation, analysis of solar radiation data, fundamentals of the solar thermal and photovoltaic system along with storage of energy required for effective design of efficient solar energy conversion devices. The concepts will be illustrated with practical examples, schematics and block diagrams wherever required. A sufficient number of numerical problems with solutions will be discussed in the course. This course is specifically designed for undergraduate and postgraduate students of Energy Engineering and Technology. Further, the course will be very much useful for students and researchers from varied academic backgrounds for the synthesis of novel energy conversion devices and processes.

COURSE PLAN :

Week 1: Energy Scenario, overview of solar energy conversion devices and applications, physics of propagation of solar radiation from the sun to earth.

Week 2: Sun-Earth Geometry, Extra-Terrestrial and Terrestrial Radiation, Solar energy measuring instruments

Week 3: Estimation of solar radiation under different climatic conditions, Estimation of total radiation

Week 4: Fundamentals of solar PV cells, principles and performance analysis, modules, arrays, theoretical maximum power generation from PV cells

Week 5: PV standalone system components, Standalone PV-system design.

Week 6: Components of grid-connected PV system, solar power plant design and performance analysis.

Week 7: Fundamentals of solar collectors, Snails law, Bougers law, Physical significance of Transmissivity - absorptivity product.

Week 8: Performance analysis of Liquid flat plate collectors and testing

Week 9: Performance analysis of Solar Air heaters and testing

Week 10: Solar thermal power generation (Solar concentrators).

Week 11: Thermal Energy Storage (sensible, latent and thermo-chemical) and solar pond

Week 12: Applications: Solar Refrigeration, Passive architecture, solar distillation, and emerging technologies.

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EDUCATION EMPOWERS

School of Business Studies invites you for workshop On

Soft Skills

Date

7 Sept.

to

19 Sept. 2020

Time

11:00 am

to

2:00 pm

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EDUCATION EMPOWERS

Workshop on
on
App Development Using Flutter

Date:
27 Feb.
to
08 May
2021

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

University Training and Development Cell

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EDUCATION EMPOWERS

"Where there is a skill, there is a way "

School of Engg. & Tech. invites you for online workshop

On

BMW 'Skill Next' Program

Resource Person

Mr. Kashi

Manager, technical training
BMW Group
Training & Innovation Center

Date

29 August to 12 September 2020

Time

11:00 am onwards

Register here:

https://docs.google.com/forms/d/e/1FAIpQLSeThvrWpXDcVDryviHe8db-SdgjF3yxUE6Dl3AIXHcTD_EJWA/viewform

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Department of Mechanical Enginering

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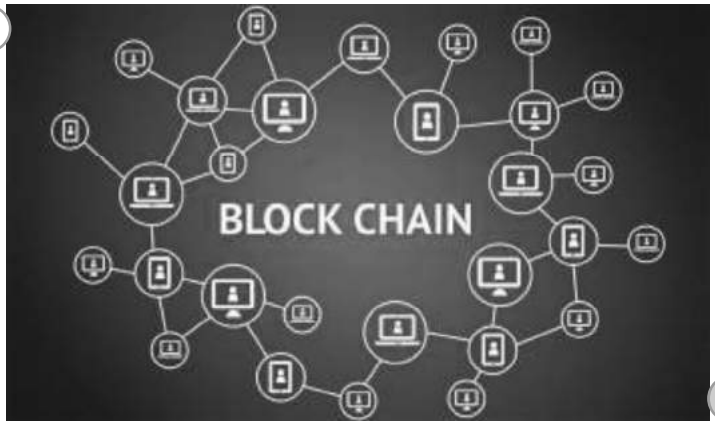
EDUCATION EMPOWERS

A Specialized Course on Blockchain Technolgy

Date:
10 Nov.
to
27 Nov.
2021



Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

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EDUCATION EMPOWERS

A Short Term Course
on
Industrial Biotechnology, Food safety and Quality Control

Date:
22 March
to
07 April. 2021

Venue:
Biotechnology Lab

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Biotechnolgy

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EDUCATION EMPOWERS

A Short Term Course

on

Website Designing, Computer Education & Internet Awareness

Date:
1st Feb.
to
17 Feb. 2021

Venue:
Computer Science Lab

Time:
3:00 pm to
5:00 Pm

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EDUCATION EMPOWERS

Workshop on on Big Data Analytics

Date:
28 June
to
14 July
2021

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

Organized by

Department of Computer Science and Engineering

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EDUCATION EMPOWERS

An online workshop on Counselling Skills

Date:
14 Sept.
to
30 Sept. 2020

Venue:
University Auditorium

Time:
3:00 pm to
5:00 Pm

Session's Link : meet.google.com/ugr-tpfc-vys

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EDUCATION EMPOWERS

Program
on
Counselling Clinic

Date:
15 Sept.
to
27 Sept. 2020

Venue:
University
Auditorium

Time:
3:00 pm to
5:00 Pm

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